Innovation Project Final Report:
Community-Focused Responses to COVID-19 and Other Emergencies
May-June 2020

PROJECT TYPE:
(highlight one in bold)

90-day Innovation Project: A full wave to scan, test, and document recommendations in a formal deliverable	***60-day Innovation Project:*** **A short project to scan, provide research assistance, or design an expert meeting**	*Content Development:* A full wave of research support with the potential for continued support

TEAM:
Lead: Alex Anderson
Support: John Whittington
Commissioners: Niñon Lewis and Paul Howard

INTENT AND AIM:
The intent of this work is to support a community focused response to Covid-19 for the next two years including:

- **Protecting** and **responding** to the immediate crisis;

- **Rebuilding** community systems post-immediate crisis to be stronger and more equitable; and
- **Preparing** the community for future events that require a coordinated, multi-sector emergency response.

The aim of this work is two-fold:

- Create a draft operating model, including components and draft protocols for a "community command center" approach that can respond in a coordinated, agile way to complex challenges with a focus on results.

- Apply the draft operating model to the specific needs of a community-focused response to COVID-19.

BACKGROUND:
We are assuming that COVID-19 will be a medical problem directly for the next 1 to 2 years and will have indirect effects on communities for 2 years or longer, no matter the sector. However, from IHI's early research, many if not most emergency response efforts happen within sectors or organizations, not across communities, and are most often focused on this initial "protect and respond" phase rather than a longitudinal approach. We believe that while this work will have an immediate application to IHI's potentially funded work on community-focused responses to COVID-19, it will also support the creation of a service IHI can offer to communities looking to address any emergency response or deploy quickly to address any complex issue

(e.g., the equitable distribution of vaccines, a return of COVID-19, a natural disaster, a major economic downturn such as a factory closure or major corporation moving out of town, etc.).

DESCRIPTION OF THE WORK:

We relied on standard R&D techniques and introduced some new tests. As with other research, we scanned the academic and grey literature for emerging best practices and conducted a small set of expert interviews, detailed below.

We worked closely with Niñon Lewis and Paul Howard as leaders of IHI's content portfolios and community health work respectively and commissioners for this work. In working together, the research team developed a practical framework that can be tested with partners engaged in existing work with IHI>

We note that this 60-day project posed unique challenges. A shortened time-frame constrained data collection and theory development. Further, the nature of the COVID-19 epidemic meant we were limited in our ability to interact with practitioners in the field implementing interventions of interest, many of which are not yet published.

Interviews

Outside IHI	Internal
David Kobielak, Emergency Management Specialist, Bellin Health	Niñon Lewis, Head of Content Portfolios
Robert Kahn, Associate Chair of Community Health, Cincinnati Children's	Paul Howard, Senior Director of Community Initiatives

FINDINGS:
During this innovation cycle, the research team sought to understand how approaches and characteristics of federal, state, and local emergency response efforts may be inform improved approaches by community health organizations. To answer this question, the research team reviewed Emergency Operation Centers – the formal emergency response strategy and structure used in the United States – and developed a prototype framework that communities can test to be better prepared to respond to community threats. This approach highlights the need for an increased focus on co-design principles to effectively engage all relevant stakeholders in a community while amplifying the perspectives of those most affected by a given emergency. In doing so, raising the specific needs and expressed wants of historically marginalized communities is necessary. This includes Black people, people of color, indigenous people, people experiencing poverty, homelessness, or other forms of income insecurity, and any population bearing a disproportionate impact of a crisis – especially when that impact is tied to a history of injustice and systemic oppression. A description of our findings follows.

Emergency Operations Center
The Centers for Disease Control and Prevention (CDC) manages an Emergency Operations Center (EOC) with dedicated staff focused on monitoring the emergence of public health threats 24 hours a day, 7 days a week, and 365 days a year. The purpose of the EOC is to monitor potential threats and convene the appropriate scientific expert and logistics and operations

experts utilizing state-of-the-art technologies to coordinate resources, information, and crisis communication systems to strengthen the nation's ability to detect and respond to public health threats.[1] The EOC is managed by the Division of Emergency Operations (DEO) within the Center for Preparedness and Response (CPR). Figure 1 provides an overview of the DEO's coordination of the EOC.
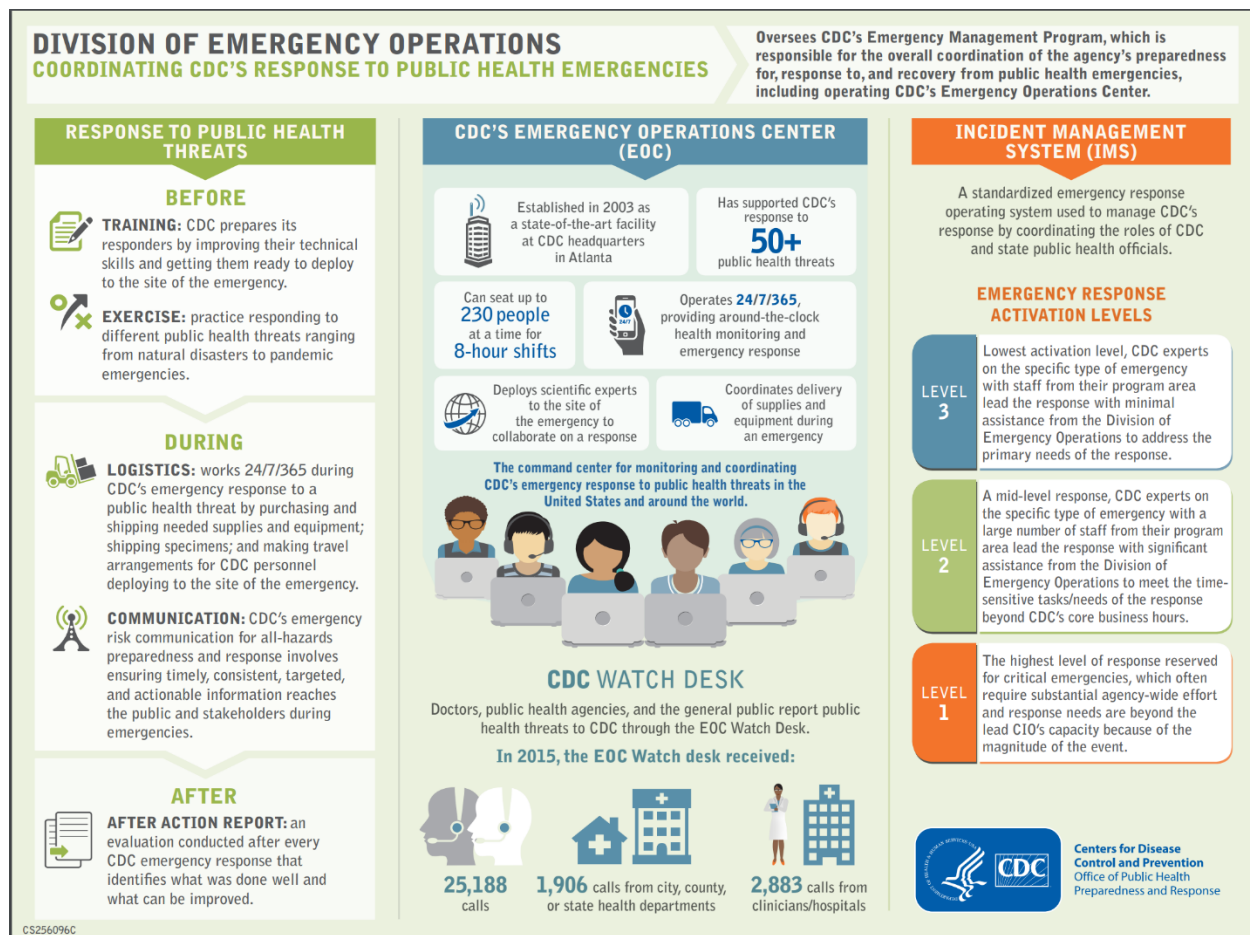

Figure 1

When no specific public health threat is present, the EOC utilizes a dedicated watch desk staff tasked with monitoring information from around the world. This includes calls: from the general public; health care providers in the field; city, county, and state health departments; public health partner briefings; field operations intelligence; and worldwide declaration of a Public Health Emergency of International Concern. In 2015, the watch desk received 25,188 calls from the public, 1,906 calls from city, county, and state public health teams, and 2,883 calls from clinicians and hospitals.[2] A declaration of a Public Health Emergency of International Concern is a formal notification as part of the International Health Regulations (IHR) agreed to in 2005. The IHR requires all participating countries maintain the ability to detect, assess, report, and respond to public health events.[3]

When potential threats are detected, subject matter experts are mobilized between the DEO and CDC to determine whether engaging the National Incident Management System (NIMS) is necessary. The NIMS is a temporary, formal organization structure that is activated to support emergency response with agility during the changing environment of an on-going emergency and deactivated when the response concludes.[4] The NIMS defines specific roles, responsibilities,

and a command structure for those responding to emergency events and provides a shared operational model for government, private sector, and nongovernmental organization collaboration. Tasks included: direction of specific incident operations; acquiring, coordinating, and delivering resources to incident sites; and, sharing information about the incident with the public. The NIMS provides the organizational structure within which the EOC operates during various emergencies.

The EOC can be activated at three levels of engagement:[5]

- Level 3 is the lowest level of activation. Existing subject matter experts within the CDC manage the response effort with the appropriate departmental staff. EOC staff may provide limit support to CDC staff as need to manage the effort. Typically, Level 3 responses are managed within regular operating hours. Level 3 responses may be applied to situations that represent and urgent public health need but do not present imminent, fatal danger. The 2016 water contamination crisis in Michigan was met with a Level 3 response.

- Level 2 involves a large number of experts from the relevant CDC department or program area as well as dedicated engagement from the EOC. Higher level roles and responsibilities are required. And, the EOC is likely to operate beyond typical business hours. A Level 2 activation took place in response to the 2011 earthquake, tsunami, and subsequent nuclear disaster in Fukushima, Japan.

- Level 1 requires an agency wide response, often involves partnership with domestic and international entities. Since the EOC's inception in 2003, there have been 5 Level 1 activations: Hurricane Katrina (2005) influenza A(H1N1) pandemic (2009-2010), Ebola Virus disease outbreak (2014-2016), Zika virus outbreak (2016-2017), and Covid-19 (2020-present).[6]

As threats evolve, responses may escalate through the levels. This escalation happens on different timelines and may skip levels based on the demands of the threat. For example, the CDC responded with a Level 3 response to the Zika virus in late January 2016, escalated to Level 2 in the first week of February, and then escalated to Level 1 the following week. Whereas, in response to the 2014 Ebola outbreaks, the CDC enacted Level 3 in July 2014 and skipped Level 2 entirely when activating Level 1 in August 2014. Figure 2 provides a timeline of CDC responses to public health emergencies.

Figure 2

Government entities rely on two primary documents for emergency preparedness and responses:[7]

- [The National Response Framework](#) (NRF) which provides the framework for federal interaction with state, tribal, and local governments; the private sector; and, nongovernmental organizations (NGOs) for prevention, preparedness, response, and recovery activities.

- [The National Incident Management System](#) (NIMS) provides a nationwide approach for federal, state, tribal and local government, the private sector, and NGOs to effectively work together to prepare for, respond to, and recover from any and all domestic incidents.

The NRF builds on the NIMS template and guidelines to establish a framework for multi-sector coordination. NIMS provides the guidance to coordinate the response structure during emergencies and at significant special events (i.e. Presidential inauguration ceremonies) and the NRF governs the resources used during and after the designated event or incident.

The National Response Framework defines emergency management components and principles including:[8] [9]

- Defined modular management structures that are scalable and flexible

- Standardized national response doctrine, including common terminologies

- Focus on communication, information management, and resource management

- Importance of operating from one set of objectives and priorities

- Understanding of joint limitations in a multiparter environment

- Protection of agency's legal authorities to conduct response operations

- Optimization of unity of effort among partners under a single plan

The National Incident Management Framework provides guidelines to apply multi-sector resources to plan for, respond to, and recover from an incident. These guiding principles include:[10] [11]

- Flexibility allowing scalable structures and procedures

- Standardization to enable interoperability among multiple organizations in incident response. This includes standard organizational structures, standard practices, and common terminology for effective communication

- Unity of Effort to coordinate activities across and between entities with different jurisdictional authority and functional responsibilities. Unity of Effort prioritizes working towards a common goal while recognizing the importance of stakeholder authority and accountability.

These NIMS principles inform the NIMS Framework which covers:

- Resource Management: covering the standard mechanisms for managing resources, personnel, equipment, supplies, teams, and facilities.

- Command and Coordination: describing the roles, responsibilities, processes, and recommended organizational structures.

- Communications and Information Management: describing the systems and methods to ensure all parties have the appropriate information at the appropriate time.

During an incident or emergency response, the available resources recommend operating within the guidelines summarized above while utilizing a command-and-control approach to leadership. This command-and-control response is recommended across resources provided for federal and state emergency operation center operations. Common principles are described in FEMA's Incident Command System (ICS) and include:[12]

- Modular Organization – organizational structures develop in a modular fashion based on the incident's size and complexity. The Incident Commander (aka Unified Command) and the EOC director are responsible for establishing and expanding the operational structure.

- Management by Objectives – operations are driven by working objectives determined by the Incident Commander. Management by Objectives requires: establishing specific, measurable objectives; developing a plan (i.e. strategies, tactics, tasks, and activities) to achieve objectives; developing and deploying workplans to complete identified tasks; and tracking results against established measures.

- Incident Action Planning – Incident Action Plans (IAP) are concise and coherent means of communicating incident objectives and work plans. Every incident should have an action plan which may or may not be codified in writing depending on the complexity of the relevant incident.

- Manageable Span of Control – a Span of Control described the supervisor-to-subordinate ratio for effective operations. The ICS recommends a 1:5 ratio as a guideline to be adjusted based on the needs of a specific incident.

- Incident Facilities and Locations – dedicated facilities will be established at the discretion of the Incident Commander and/or EOC director based on the needs of a given incident.

- Comprehensive Resource Management – the ICS provides describes process for effective management of personnel, equipment, teams, supplies, and facilities.

- Integrated Communication – the necessary equipment, systems, and protocols for communicating are important to plan before and during an incident. Specific guidelines are provided in the ICS.

- Establishment and Transfer of Command – the Incident Commander should establish the command function at the beginning of an incident. This establishes jurisdiction and responsibility to maintain command as operations and protocols are transferred to more localized leadership for the duration of an incident.

- Unified Command – Unified Command is applied when an incident's size, scope, or severity indicates multiple jurisdiction, agency, and/or organizational response without any one stakeholder having the authority and/or resources to manage the incident on its own. Unified Command replaces the role of Incident Commander with a set of jointly approved objectives where various agencies continue to operate with their own authority and responsibility while working towards shared priorities.

- Chain of Command and Unity of Command – Chain of Command establishes operational hierarchy and Unity of Command describes the structure whereby each person only reports to one person. Figures 3, 4, and 5 below show examples of a command structure.

- Accountability – standard procedures are determined to ensure individual and organizational accountability. This covers activities ranging from action planning and personnel reporting to tracking for the use of resources.

- Dispatch and Deployment – resources should only be deployed within the context of defined action plans and at the request of the appropriate authority. Spontaneous deployment of resources should be avoided to limited confusion and wastefulness.

Position Titles

Organizational Element	Leadership Position Title	Support Positions
Incident Command	Incident Commander	Deputy
Command Staff	Officer	Assistant
Section	Chief	Deputy, Assistant
Branch	Director	Deputy
Divisions/Groups	Supervisor	N/A
Unit	Unit Leader	Manager, Coordinator
Strike Team/Resource Team/Task Force	Leader	Single Resource Boss
Single Resource	Boss, Leader	N/A
Technical Specialist	Specialist	N/A

Figure 3. ICS Position Titles

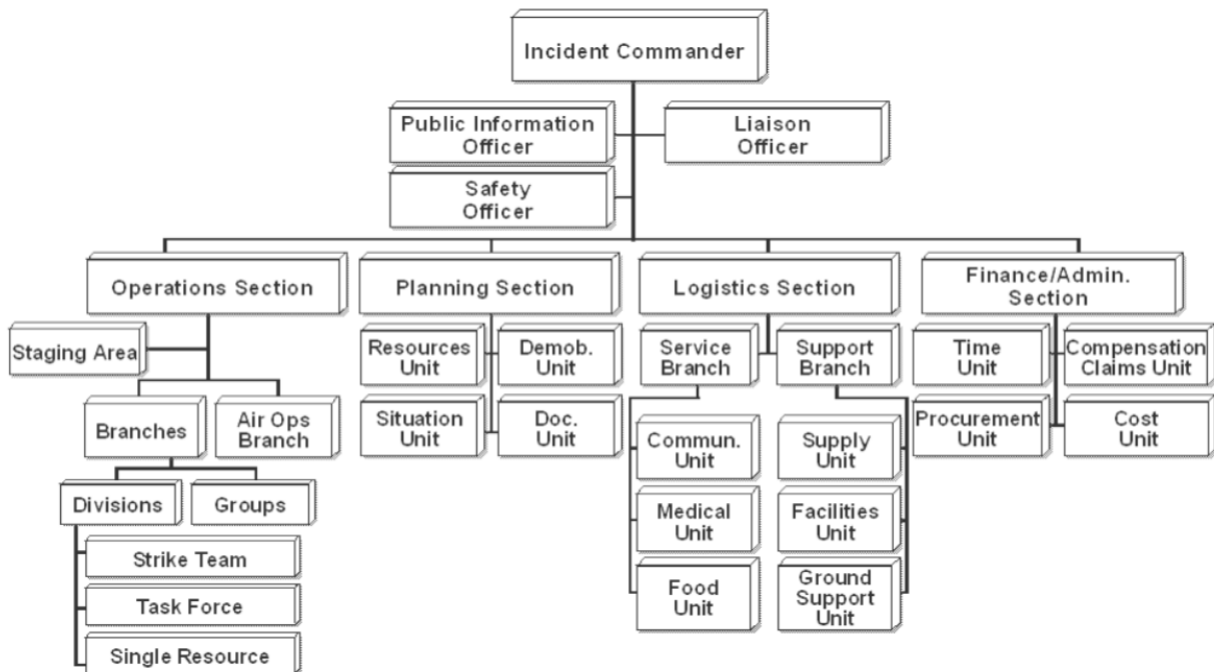# ICS Organizational Structure and Elements

Figure 4. ICS Organizational Structure and Elements
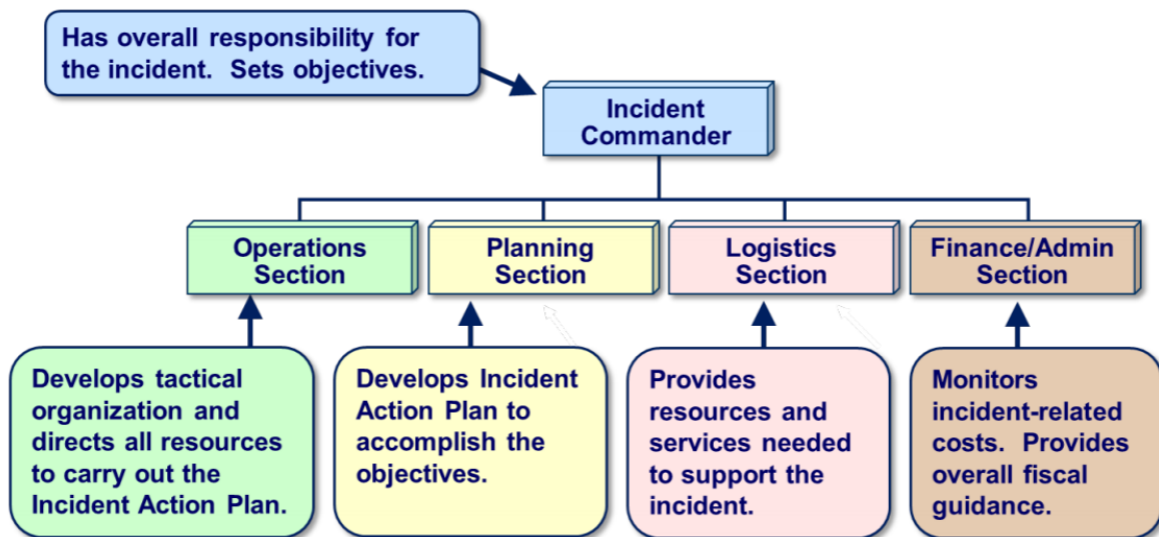
ICS – Who Does What?

Figure 5. ICS - Who Does What?

After an emergency response concludes, the CDC continues to operate the constant process of planning, training, exercising, and evaluating. Assessments are conducted to establish what worked well and where improvements could be made. After Action Reports (AAR) and improvement plans are drafted for future preparations. For example, after FEMA's response to

the 2017 hurricane season, an AAR was conducted and published publicly. Key takeaways included:[13]

1) The need to build a culture of preparedness before a crisis starts including having the right supplies, personnel, and training at the ready in the event of a crisis.

2) The need to ready all levels of government for adaptive and collaborative responses to crisis.

3) The need to reduce the complexity of FEMA strategy, hierarchy, and operations.

These takeaways provide guidance for what a community command approach might incorporate into its strategy and operations.

Comparison to Community Health Response

Based on review of the materials describing government approaches to emergency operations and incident management, we are concerned that the approach does not place an adequate focus on the voice and participation of the community. The command-and-control approach does not involve all of the important stakeholders in the community, at the right time during each phase of crisis management planning and execution. Given the nature of the emergencies for which these entities are responsible, the top-down, authority-driven approach may be necessary. And, for community organizations looking to improve community response to a wider range of challenges, an approach rooted in community-based practices like co-design and co-production may prove more successful. Tothe degree that all emergency responses require buy-in and participation from all members of the community for the most effective response to take place, meaningful involvement from all community stakeholders is likely to improve outcomes.

There are distinctions and alignment between the approach of EOCs and many of the concepts described in the [Community of Solutions (COS) framework](#) utilized by IHI's community health work through 100 Million Healthier Lives and other initiatives.[14] The primary conflict between the guidelines described by EOC resources and the COS approach stems from the EOC's reliance on rigid hierarchy and command-and-control operations. However, the intention behind the approaches can provide important insights for enhancing the preparedness of any community to tackle a variety of emergency incidents. The following comparison of these approaches provides a starting point for understanding what design characteristics should be present in a community command effort:

	EOC	**COS – Community Response to Problem**
Nature of Problem	Sentinel event/Immediate, acute/specific, time constrained	Long standing/Persistent, multiple factors
Stakeholders	Defined by clear agency, authority, jurisdiction	Defined by those willing and able to engage in the work, opting-in
Action Planning	Priorities, Objectives set by Indecent Command and Unity of Command	Priorities, Objectives set through co-designed/collaboration, work plans based on asset mapping, narrative

Hierarchy	Top-down Chain of Command, command-and-control	Distributed/Shared Leadership
Methodologies	Incident Action Plans, measurement, tracking	Aims, Theory of Change, measurement, tracking
End of Work	Formal de-escalation, finality, After action review	Slow ramping down of work as emergency wanes; continuous learning

Based on the similarities between the EOC approach and existing COS work, an approach for Community Focused Response to Emergencies like COVID-19 can be developed. An effective approach might improve community preparedness and response. Communities will be best able to manage emergency community needs by taking preparatory actions before an incident emerges, applying agreed upon protocols during an emergency, and making improvements based on learning and evaluation for future incidents. Different levels of resourcing, engagement, and activity will be required at different phases of an incident's lifecycle. These phases include:

- **Prior to identifying a threat**. Regardless of the type of community emergency, certain activities and responses will be necessary. Having pre-agreed upon guidelines for strategy, stakeholder engagement, and resourcing and operations can save precious time and avoid unnecessary, duplicative work.

- **Emerging Threat**. Some threats are persistent (i.e. a population with high rates of diabetes or unsafe drinking water). Others emerge overtime – sometimes, quickly like COVID-19 or more gradually like declining population health amongst generations succeeding initial immigration.[15] Establishing guidelines/rubrics for when and how to enact a community response will increase the reliability of a community response.

- **Threat is in the Community**. As an emergency response takes place, on-going support – both financially/operationally and motivationally – will be necessary to achieve desired results.

- **Threat is Controlled**. As results are achieved and the threat is controlled, deescalating the response will be necessary. A shared understanding of "what success looks like" in general terms will keep stakeholders on the same page about transitions.

- **Community is in Recovery**. Continuous preparation is best supported by documenting learnings from previous activities and making improvements for future responses. Supporting a learning system will aid in this effort.

Developing the right relationships and commitments to a community focused response will require an appropriate strategy and structure that aligns the resources and interests of stakeholders in the community. EOCs and the approaches described in governmental responses provide many useful approaches that can be adapted for the community setting. Several design principles are necessary for creating a reference framework for how a community focused response might work.

- **Equity** – Community emergencies stress existing systems. In normal times, existing systems provide inequitable access to and delivery of goods and services to different populations. Black, indigenous, and people of color (BIPOC) experience harms tied to systemic oppression by receiving a disproportionately low share of resources and a disproportionately high level negative consequences related to an emergency. For example, Black Americans are dying of COVID-19 at three times the rate of white people.[16] And, underlying causes of this inequity may be tied to systemically unjust social determinants of health like pollution,[17] lower rates of trust between the Black community and the medical community limiting effective interactions,[18] and pre-existing medical conditions more common in the Black community due to structural conditions tied to historic racism and oppression.[19]

  The ways in which BIPOC communities are disproportionately experiencing the harms of COVID-19 displays the complex interaction between specific emergent situations and long-standing community emergencies. The importance of existing relationships and trust between the entities responsible for addressing an emergency and people and communities affected by it cannot be understated. Building relationship and trust takes time and requires an approach rooted in equity. This means acknowledging the ways in which systemic oppression affects the community and taking strategic steps to place those most affected by the situation at the center of the planning, ideation, and response to emergency situations.

- **Co-Design and Collaboration –** The principles of co-design and collaboration are core tenants of human-centered design and adaptive leadership. Starting from a place of equity, communities must come together to understand the resources and interests of each stakeholder group. All parties should have space to shape the strategy and approach and collectively determine how to proceed at each phase of an emergency. This approach does not mean that all stakeholders need equal participation at each phase of the process. It only requires that all stakeholders convene to determine who will participate, how they will participate, and at what moments in time they will participate. Having a clear and established understanding of who is responsible for what and how the various stakeholders will work together before an emergency arises will best prepare a community to respond effectively.

- **Continuous Learning and Improvement –** Quality improvement and adaptive leadership approaches stress the importance of continuous learning and improvement. These design principles are especially true when preparing for emergency in a community. Regardless of the amount of planning, when an emergency hits, flexibility and agility will be necessary to respond

to unexpected needs that arise. A commitment to and strategic approach for continuous learning and improvement will be necessary.

Based on these principles, communities can come together and agree to approaches for how they might work together in response to community emergencies. Table 1 provides a framework for identifying the stakeholders, leadership and operational approach, and activities. Convening bodies can recruit the relevant stakeholders in a community during periods of relative calm to gain consensus on how they will work together during a crisis. A completed table can provide a memorandum of understanding or community response charter to inform

CONCLUSIONS

Communities can be better prepared to address community emergencies by engaging in a planning process to identify how the appropriate stakeholders will work together to respond to a crisis. The experience addressing the COVID-19 pandemic – from the experience of managing the health care crisis and the related impacts on community health, economic stability, and general wellbeing – presents a unique opportunity to apply learnings to future preparedness. IHI's community health partners are well poised to conduct and initial prototype test centered on the Community Response Framework. In convening one community, this prototype can be applied and iterated in service of on-going response to COVID-19 and future emergency situations.

OPEN QUESTIONS:

1. Does a community currently exist who is willing to test a framework approach?
2. What amount of training in EOC approaches is necessary to prepare community stakeholders?

Table 1. Community Response Framework

	Prior to Identifying a Threat	**Emerging Threat**	**Threat is in the Community**	**Threat is Controlled**	**Community is in Recovery**
Stakeholders	Open to All Willing Designate core stakeholders for monitoring (likely those most potentially impacted/most willing)	Open to All Willing Core stakeholders + additional recruited	Open to All Willing	Open to All Willing	Open to All Willing
Leadership and Operational Approach	Core stakeholders survey others, collect perspectives, synthesize responses, and determine/ delegate activities as needed Leadership approaches will vary based on specific emergency/incident	More intentional incorporation of co-design principles	Co-design, distributed leadership	Co-design, distributed leadership	Co-design, core stakeholders
Activities	Establish Identification protocols Establish decision metrics/rubric for escalation Establish operations and communication				

[1] CDC Emergency Operations Center (EOC), Centers for Disease Control and Prevention

[2] Division of Emergency Operations: Coordinating CDC's Response to Public Health Emergencies, Centers for Disease Control and Prevention

[3] Global Health Protection and Security: International Health Regulations (IHR), Centers for Disease Control and Prevention

[4] CDC Emergency Operations Center: How an EOC Works, Centers for Disease Control and Prevention

[5] Emergency Operations Centers and Incident Management Structure, Centers for Disease Control and Prevention

[6] At the time of writing, publicly available information does not include confirmation that Covid-19 is a Level 1 activation. CDC resources were last updated in 2016 and only note the first four activations listed above. However, it is likely this reflects the lower priority of updating informational resources on CDC.gov while the agency is managing the crisis.

[7] Federal Emergency Preparedness, U.S. Department of Health & Human Services

[8] National Response Framework, 4th Edition, U.S. Department of Homeland Security

[9] Emergency Operations Centers and Incident Management Structure, Centers for Disease Control and Prevention

[10] IS-700.b An Introduction to the National Incident Management System, National Incident Management System

[11] National Incident Management System, 3rd Edition, Federal Emergency Management Agency

[12] ICS Review Document: Intermediate Incident Command System for Expanding Incidents, ICS 300, Federal Emergency Management Agency

[13] 2017 Hurricane Season FEMA After-Action Report, Federal Emergency Management Agency

[14] Overview of SCALE & a Community of Solutions, Institute for Healthcare Improvement

[15] The Health Toll of Immigration, The New York Times

[16] The Color of Coronavirus: COVID-19 Deaths by Race and Ethnicity in the U.S., APM Research Lab

[17] One reason why coronavirus is hitting black Americans the hardest, Vox

[18] Black Americans face higher COVID-19 risks, are more hesitant to trust medical scientists, get vaccinated, Pew Research Center

[19] Why are Blacks dying at higher rates from COVID-19?, Brookings