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Centering Health Equity in the Implementation of the Hospital Incident Command System: A Qualitative Case Comparison Study

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Abstract

Objective: Disasters exacerbate inequities in health care. Health systems use the Hospital Incident Command System (HICS) to plan and coordinate their disaster response. This study examines how 2 health systems prioritized equity in implementing the Hospital Incident Command System (HICS) during the coronavirus disease 2019 (COVID-19) pandemic and identifies factors that influenced implementation.

Methods: This is a qualitative case comparison study, involving semi-structured interviews with 29 individuals from 2 US academic health systems. Strategies for promoting health equity were categorized by social determinants of health. The Consolidated Framework for Implementation Research (CFIR) guided analysis using a hybrid inductive-deductive approach.

Results: The health systems used various strategies to incorporate health equity throughout implementation, addressing all 5 social determinants of health domains. Facilitators included HICS principles, external partnerships, community relationships, senior leadership, health equity experts and networks, champions, equity-stratified data, teaming, and a culture of health equity. Barriers encompassed clarity of the equity representative role, role ambiguity for equity representatives, tokenism, competing priorities, insufficient resource allocation, and lack of preparedness.

Conclusions: These findings elucidate how health systems centered equity during HICS implementation. Health systems and regulatory bodies can use these findings as a foundation to revise the HICS and move toward a more equitable disaster response.

In a disaster, historically marginalized populations experience systemic barriers and injustices because of unequal power dynamics across multiple dimensions, such as race, gender identity, sexual orientation, physical ability, language, immigration status, and several other characteristics rooted in the social determinants of health.[1–4] As a result, disasters have consistently exacerbated inequities in morbidity, mortality, and access to health care for historically marginalized populations.[5–11] Health-care systems use the Hospital Incident Command System (HICS) to plan and coordinate their disaster response[12]; however, there is no requirement or explicit guidance to consider health equity in the HICS structure or its implementation.[13]

The HICS originated from the Incident Command System (ICS), a core component of the National Incident Management System, which assists public agencies in coordinating their disaster response by providing a common language and guidance across sectors, allowing for cross-coordination among multiple organizations or hospitals within a health system in a Unified Command structure.[14] The fundamental components of the HICS are a clear chain of command with predefined roles to streamline communication and decision-making, a flexible and scalable structure with a modular design that can be adapted for each incident, and a focus on objectives and action planning to provide strategic direction efficiently.[12] The incident commander leads the HICS and collaborates closely with the command team comprising several officers. Each officer and section role has a Job Action Sheet, which details the tasks for each role by time frame.[12] Even though the HICS is structured as a hierarchy, it functions as a centralized network with the incident commander at the center, receiving inputs from HICS members.[15]

When viewed through the lens of implementation science, which is the study of how interventions are translated into practice, one can appreciate potential challenges with implementing the HICS.[16] Context, or how interventions are woven together within a given environment, is a critical component of implementation,[17] and the constantly shifting context of disasters and complexity of roles and relationships involved in the HICS can pose challenges to implementation.[18,19] There is a paucity of implementation research on ICSs; however, 1 review

of cases found that adding new members as the crisis increased in size and complexity disrupted the stability and efficiency of the ICS.[15] This creates a tension between inclusiveness and efficiency, with new members adding expertise but costing time in coordination and integration into the established norms.[15] Even with the loss of efficiency, networks benefit from increasing the heterogeneity of backgrounds and expertise.[18] Additional perspectives are critical when prioritizing health equity, which is more effective when decision-making includes diverse leaders.[20]

The coronavirus disease 2019 (COVID-19) pandemic led to a widespread activation of HICSs across the United States.[21] Trends from past disasters were repeated, with inequities in infection rates, morbidity, and mortality.[7] These inequities were also present within the health-care workforce, with people of color and lower-wage frontline workers disproportionately impacted by the pandemic.[22] The protracted response and dual crises of COVID-19 and systemic racism led to several novel strategies to include equity in the disaster response. Health equity can be considered as a process by removing systemic and structural barriers to health and an outcome with all individuals having a fair and just opportunity to be healthy.[23]

There is a recognized need for practice-based studies incorporating health equity into implementation science and building up the evidence base for public health emergency preparedness and response.[24,25] We must explore successful implementation efforts to inform improvements for future disasters. This study aims to address the gap at the nexus of implementation science, health equity, and disaster research to explore how 2 academic health systems centered equity throughout the implementation of their HICS and identify elements that influenced implementation.

Methods

Study Design

This study is a retrospective, qualitative case comparison study. The Consolidated criteria for reporting qualitative research checklist was used as a reporting framework.[26] The Johns Hopkins Bloomberg School of Public Health IRB has reviewed and approved this study.

Conceptual Framework

The Consolidated Framework for Implementation Research (CFIR) is a meta-theoretical framework that includes constructs from existing implementation theories and frameworks and comprises 5 domains: outer setting, inner setting, individual characteristics, intervention characteristics, and process. Each domain contains multiple constructs associated with effective implementation. CFIR can be used after implementation, selecting the most salient constructs to identify barriers and facilitators and inform future efforts to spread and scale the intervention.[27,28]

Study Setting

The 2 academic health systems, System A and System B, were identified through a literature review focused on embedding equity into the HICS. They are high-performing, high-reputation health systems in the United States located in diverse urban communities. The systems are structured differently, with System A as part of an integrated health system that includes other health systems and over 10 hospitals. In contrast, System B is part of an enterprise comprising the health system and a university. There was a Unified Command for each health system at the level of the integrated health system for System A and enterprise for System B, which had representatives from a Unified Command for each health system, comprised of individual HICS for each hospital or ambulatory location. Our study focused on the health system level so we chose to use the term HICS for the health system Unified Command for simplicity.

Participant Recruitment

This study used purposive sampling first to recruit participants who were members of the HICS or regularly interacted with the HICS during the COVID-19 pandemic response. Then snowball sampling was used to identify other potentially relevant participants by asking for contacts at the end of each interview. Participants were contacted up to 3 times from January through May 2022 by means of secure email.

Data Collection

The CFIR was used as the foundation for the semi-structured interview guide (Supplementary Material 1). This study focuses on constructs within the intervention, inner setting, outer setting, and process domains. We chose the intervention domain because this approach is novel and the process domain because of the challenges with implementing changes in the HICS. The inner and outer settings were chosen because of the importance of the health system and community context in health equity.[25] For this study, the inner setting is the hospital, health system, and integrated health system; the outer setting is external organizations and the community. Questions corresponded to constructs within these domains and mapped to the interview guide.

Interviews were conducted by 1 researcher (R.M.S.), a female physician assistant with experience in implementation, qualitative research, and emergency medicine. The interviews were 30 min to 1 h over a password-protected video conferencing platform. Interviews were audio-recorded with permission, and an auto-generated transcript was created and reviewed for discrepancies. After the interview, R.M.S. took field notes to capture overall impressions. Data collection continued until at least 1 equity representative and incident commander were interviewed at each site, and participants identified no further contacts. In addition to exhausting contacts, we reached data saturation, with information from new interviews being redundant to information we had already collected.[29]

Data Analysis

During the analysis, the approaches used by the sites to promote equity were consolidated under a single code. Subsequently, these approaches were categorized based on the social determinant of health domain they potentially impacted.[30] This study used a constructivist approach with a hybrid of inductive and deductive thematic analysis as described by Fereday and Muir-Cochrane.[31] First, we developed a codebook with a priori codes using CFIR constructs and their standardized definitions provided in a CFIR codebook template.[32] Then data were analyzed using Nvivo (version 10.0, QSR International), and data that did not fit into the pre-selected CFIR codes were inductively coded with new themes added under new codes. The first transcript was coded by 2 authors (R.M.S., C.T.Y.) to validate the coding frame which was used for the remainder of the transcripts. After coding was complete, word tables were created for second-order coding and cross-case

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Table 1. Participant characteristics

Variable	System A ($n = 16$)	System B ($n = 13$)
Gender identity[a]		
Female	6	6
Male	6	4
Not reported	4	3
Race/ethnicity[b]		
Asian	0	1
Black or African American	3	4
Hispanic, Latinx, or Spanish origin	0	1
White	9	7
Not reported	4	3
Leadership role		
Executive	11	5
Other leader	4	7
None	1	1
Role in Incident Command		
Incident Commander	2	1
Command staff	4	1
Section Chief	4	3
Other role in Incident Command	2	0
No formal role in Incident Command	4	8

[a]No participants identified as non-binary, transgender, or agender.
[b]Participants may be represented in multiple categories. No participants identified as American Indian or Alaskan Native, Middle Eastern or North African, Native Hawaiian, or Pacific Islander.

comparison. Next, relationships were identified between the deductive and inductive codes, connecting related codes. Finally, the tables were reviewed for significant themes and categorized as barriers or facilitators. To enhance rigor this study used member checking, sending all participants a summary of the themes identified and asking for feedback.[33] Responses were reviewed for applicability to the research question and integrated into the results.

Results

This study includes 29 individuals, with 16 participants from System A and 13 from System B, representing a mix of roles in the HICS (Table 1).

Description of the Approaches to Incorporate Health Equity Into the HICS Implementation

The systems used several strategies to incorporate health equity in their HICS as they responded to needs in the evolving context of the COVID-19 pandemic. These approaches often happened simultaneously, with some permanently embedded in the HICS and others temporarily responding to a specific need. Both systems included strategies that addressed all 5 domains of the social determinants of health, to reduce structural and systemic barriers for their employees and patients,[30] summarized in Table 2. Although there were many similarities, System B was more outwardly focused on community-based initiatives, while System A had a more operational focus.

Early in the pandemic response, both systems added an equity representative in the HICS, although they took different approaches, reflected in the networks formed around them (Figure 1). The equity representative was described as someone who provided subject matter expertise, advocated for historically marginalized populations, and partnered with others to operationalize solutions. System A formally added the equity representative to the HICS organizational chart, reporting to the command staff and acting as a bridge for bidirectional communication. In contrast, the equity representative in System B was the Chief Diversity Officer; and although not formally added to the HICS they attended meetings, reported on equity issues, and were involved in several equity-focused committees.

Perceived Success

Every individual interviewed supported sustaining an equity focus when implementing the HICS for future disaster responses. They agreed that the approaches used were successful and care was more equitable because of their efforts. Seven participants qualified this by noting a greater need related to social determinants of health and systemic racism that the HICS could not adequately address.

Implementation Barriers and Facilitators

Nine facilitators and 5 barriers to centering health equity in implementing the HICS were identified in this study (Table 3).

Facilitator: HICS principles

The HICS provides a template that adapts to the unique needs of different disasters, facilitating the quick addition of an equity representative and the evolution of the role throughout the response. Other fundamental HICS principles that facilitated implementation were situation reporting on equity at meetings (eg, COVID-19 admission rates stratified by demographic identifiers, community outreach events) and including equity in the after-action report.

Facilitator: External partnerships

Both sites partnered closely with external organizations in response to the pandemic, including their state government and health departments, to collaborate on allocating scarce resources, equitable vaccine distribution, and data sharing. The partnerships were bidirectional and synergistic, leveraging each site's strengths and facilitating sharing resources and information.

Facilitator: Community relationships

Participants stressed that the HICS must hear directly from the community to provide a culturally-attuned disaster response. They did this through community outreach events, such as mobile vaccine and testing initiatives and partnering with community organizations. Relationships that had been formed before the pandemic were activated, allowing for a rapid community response. Information from the community helped the sites identify challenges such as lack of housing and food, create informational campaigns around vaccine hesitancy, and provide critical context to the population they serve.

Facilitator: Senior leadership

Senior leaders, such as the incident commander and other executive leaders (eg, Chief Medical Officer, Health System President) heavily influenced the adoption of health equity into implementation. Influential leaders communicated that equity was

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Table 2. Summary of approaches categorized by social determinants of health domain

Economic stability	Education access and quality	Health-care access and quality	Social and community context	Neighborhood and built environment
Community ‣ Distributed food and household supplies at community outreach events ‣ Connected people to social services for support (e.g., food, housing, employment, cash assistance) ‣ Distributed infection prevention supplies (masks, hand sanitizer) at community outreach events Employees ‣ Provided free or subsidized childcare for employees	Community ‣ Sought trusted sources in the community and partnered with them for education campaigns using multiple mediums for communication (e.g., social media, flyers in barber shops) ‣ Held community informational sessions about COVID-19 in various venues (e.g., town hall, worship service, PTA meetings) ‣ Created and staffed call center for the community to ask physicians COVID-19 related questions Employees ‣ Provided communications in multiple languages and accessible formats at community events and to employees ‣ Developed educational program for managers on sharing information with staff using culturally appropriate communication	Community ‣ Established community-based testing, vaccination sites, and mobile services with a focus on special populations (e.g., elderly, individuals with disabilities) ‣ Expanded translation services (e.g., tablets, consult service for bilingual clinicians to act as interpreters) ‣ Used equity stratified data in decision-making (e.g., vaccination rates, admissions, ICU census) ‣ Revised triage plans and allocation of scarce resource policies to promote equity (e.g., crisis standards of care, ventilators, monoclonal antibodies) ‣ Allocated portion of vaccines to historically marginalized groups ‣ Created equity teams to promote collaboration on equity initiatives ‣ Partnered with other health systems and agencies to promote access to care	Community ‣ Assisted with voter registration and filling out census forms ‣ Held community town halls about legal rights for housing eviction ‣ Partnered with local community-based organizations and opinion leaders for outreach events ‣ Trained triage team on implicit bias	Community ‣ Provided and staffed temporary housing for homeless or housing insecure individuals with mild cases of COVID-19 to safety isolate and receive medical care ‣ Advocated to the local government on the housing eviction moratorium ‣ Connected people with social services for housing assistance Employees ‣ Offered temporary lodging and safe transportation accommodations for employees

Abbreviations: COVID-19, coronavirus disease 2019; ICU, intensive care unit; PTA, parent-teacher association.

an expectation and worked to "pull" equity information up instead of waiting for the equity representative to "push" it up. They proactively sought input on others' perspectives to understand the historically marginalized populations they serve. In addition, they encouraged others to speak up about equity and propose creative solutions, contrary to the typical hierarchical nature of the HICS.

Facilitator: Health equity experts and networks

Deep expertise in health equity enabled implementation at both sites. The HICS was able to draw from existing subject matter experts and the equity representative leveraged their informal networks with others involved in equity across the organization. They used these networks to break down silos and collaborate on the disaster response, creating solid relationships that participants credited for the sustainability of many efforts.

Facilitator: Champions

The initial catalysts for incorporating health equity into the HICS were vociferous champions who passionately advocated for health equity. The most notable champions included the equity representatives, and those with a close connection to the community (eg, ambulatory health, community liaison). Champions were effective because of their ability to communicate on behalf of historically marginalized populations and their willingness to take initiative and act.

Facilitator: Equity-stratified data

Equity-stratified data enabled System A to monitor effectiveness in real time, identify gaps, and set quantifiable goals around equity. The data were reviewed at every HICS meeting and shared with staff at town hall meetings led by the HICS. This data-driven approach had a powerful effect, providing evidence and an impetus for action. System B relied less on equity-stratified data and primarily accessed data through the local health department.

Facilitator: Teaming

The constantly evolving needs throughout the pandemic required nimbleness, and teaming (ie, forming dynamic teams to address specific problems[34]) was the primary mechanism to implement solutions to address gaps in health equity. Teaming occurred on different scales, sometimes as large committees and others as small teams of a few individuals. The teams would expand or contract to ensure the inclusion of the relevant experts, with the equity representative present or leading many of the teams. The willingness to be flexible and partner to accomplish tasks was inspiring to those involved and credited for the robust response.

Facilitator: Culture of health equity

The increased awareness of systemic racism and the data demonstrating inequities in COVID-19 outcomes created tension for immediate changes in the HICS. Participants described the transformation in individuals' receptivity to equity throughout the pandemic, recognizing that everyone was at different places in the internal work of exploring biases and recognizing the role of systemic racism in society. Each system began the pandemic with differences in the culture around health equity, with System A just beginning the work and System B having equity established as part of its organizational culture.

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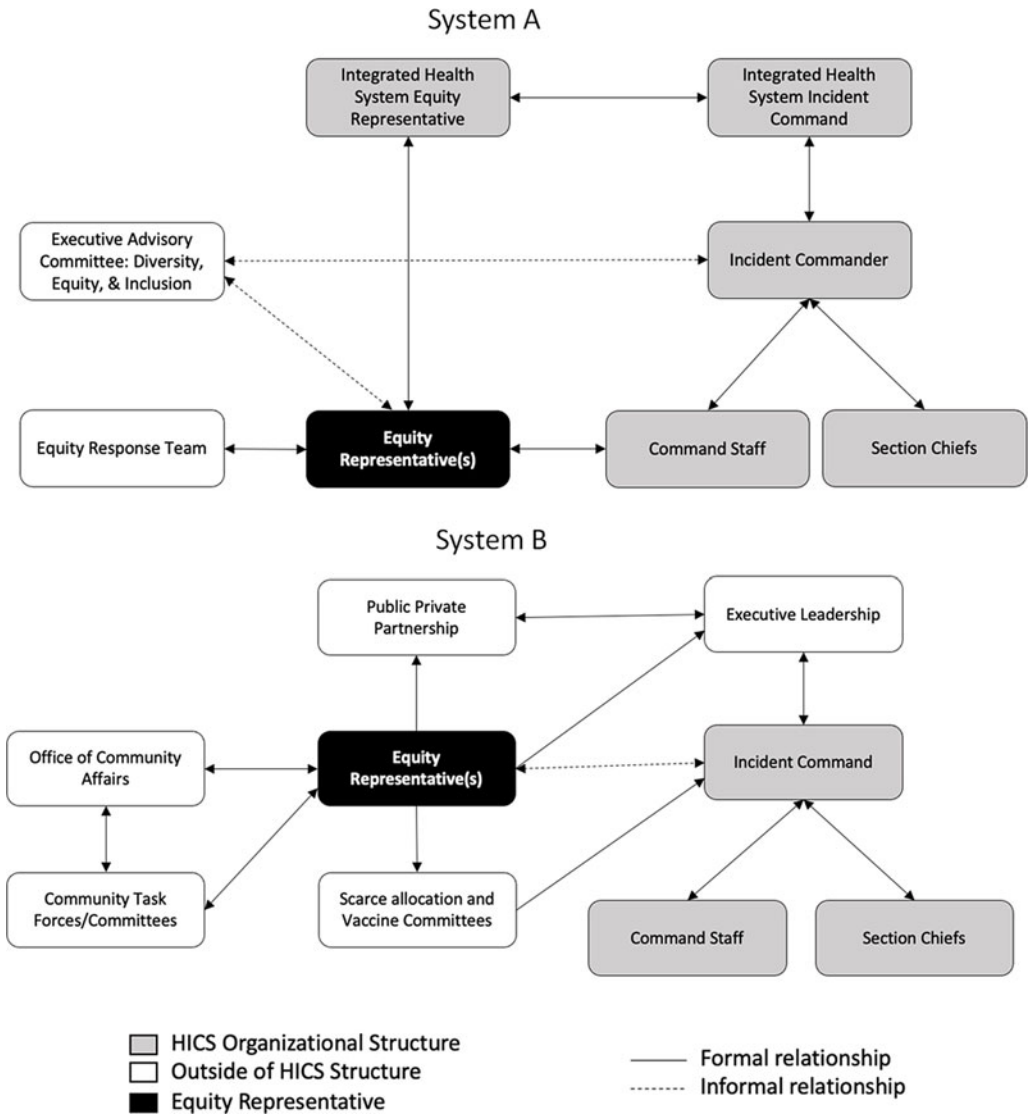

Figure 1. Equity representative networks.

Barrier: Clarity of the equity representative role

Both sites failed to formally define the role of the equity representative, which created confusion. Even though System A added the equity representative to the organizational chart, there were still questions related to the scope of the role, channels for communication, and the division of tasks among others leading equity-related efforts. System B never formalized the role on the organizational chart, and participants were unsure how the equity representative fit into the HICS, to whom they reported, and the scope of their role.

Barrier: Tokenism

There was tension around the risk of tokenism, with the equity representative only serving a symbolic role. Equity representatives expressed frustration with expectations placed on them to solve any issues related to people of color. They believed they bore the responsibility for entire populations instead of it being the collective responsibility of the HICS. When probed about this topic, participants agreed that equity should be everyone's responsibility, and some expressed that the equity representative role promoted this by advising and partnering with the HICS as a subject matter expert. However, others believed that having an equity representative abdicates leaders from being responsible for equity. Despite these differences, participants viewed the equity representative as a first step, with future responses including equity subject matter experts in multiple areas of the HICS.

Barrier: Competing priorities

Ensuring an equitable disaster response requires a thoughtful approach and taking the time to consider the needs of different populations. This balance can be particularly challenging in a disaster, with the HICS managing several competing priorities with finite resources. The process of incorporating equity considerations can interrupt plans and be a significant barrier in the rapid decision-making central to the HICS.

Barrier: Insufficient resource allocation

The equity representatives were involved with equity efforts before the pandemic and were able to pivot quickly; however, they spent significant time outside of their regular job responsibilities for their new role. The equity representatives had small teams, which made it difficult to act, with 1 participant commenting that this

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Table 3. Themes and represenative quotes

Theme (CFIR Domain:Construct)	Representative quotes	
	System A	System B
Facilitators		
HICS principles *(Intervention characteristics: Adaptability)*	*"HICS structures are a guideline really, and you can manipulate and move and twist and contort the structure to meet the needs of the scenario. But there's a core template that's sort of recommended . . . I think having a equity representative there, and I think as a stand alone entity at least right now is the right way to do it . . . if the crisis that you're dealing with does not actually present any health equity concerns then that's a very short report out, but for completeness sake you know you have it in there because that's the beauty of the Hics structure."- Command Ctaff*	*"The incident commander gave recommendations. That group then initially got together and we decided who needed to be added . . . when we started tackling equity issues you needed leaders from the relevant areas . . . so the group grew over time . . . to make sure to have the expertise and experience it needed." - HICS Connection*
External partnerships *(Outer setting: Cosmopolitanism)*	*"We were tapping into people . . . there was a department at [other local hospital] who had really deep relationships, she helped us bring all those folks together in a way that we had sort of done but hadn't really done with the intention and intensity that we did during COVID." - HICS Connection*	*"When the pandemic hit you know there were three CEOs [System B, Other AMC, Health insurer] . . . they got together and said, 'We cannot get through this pandemic without collaboration, without our partnership, and the city can't get through this without our input and expertise', . . . and they formed the partnership." - HICS Connection*
Community relationships *(Outer setting: Cosmopolitanism, Patient needs and resources)*	*"Being able to understand the disparate impact on different populations and really hear it from the perspectives of the people who are experiencing that impact is critically important as opposed to sort of assuming and dropping in." -Command Staff*	*"We have a community conversation . . . every year and it's grown. . . . there's a core group of about a dozen organizations that we had a real strong relationship with and that group was who we reached out to initially when COVID hit. I reached out with specific questions, first was 'how are you doing?' and my second was 'how is your organization doing?' and 'how are the folks that you're serving, your clients, individuals, families, and the neighborhood, how are they doing?' 'What resources do you need to be able to operate?'" - HICS Connection*
Senior Leadership *(Inner setting: Implementation climate, Readiness for implementation)*	*"If the boss gets it, everything else is easier . . . our [Chief Medical Officer] had an equity focus of his work, that was what enabled all of this, he was able to say as we set up incident command, 'you guys have to set this stuff up' otherwise it wouldn't have happened." - ER-1*	*"We had equity minded and inclusive leaders already, which was great, but had we not then it would have been much more challenging . . . the leaders all the way down,I mean everybody was like sleeves, rolled up, boots on the ground." - ER*
Health equity experts and networks *(Inner setting: Readiness for implementation, Networks and communication)*	*"It just made sense for it to be a continuous response rather than broken up and so I reached out to people on Saturdays and sent texts and emails and just said can you help? . . . I think the important principle here is that we wanted it to be sustainable, so we reached out to people who had that as their job." - ER-1*	*"We brought together a team of people who were related to the pandemic in one way or another and were equity driven in their approach and strategy and execution." - HICS Connection*
Champions *(Process: Engaging)*	*"I had pressure from those different [equity] silos asking, 'hey, are we representing equity here or not?' and I was like, 'oh, I'll keep an eye on it' and they were like 'are you sure, don't you think one of us should do this?' and I think that's the way it [ER role] sort of probably came about."- Command staff*	*"It had to do with me talking to the incident commander saying, 'you know they ran out vents in New York we probably need to figure out what we're going to do if this happens here', he said 'you're right, why don't we form a group [equitable scarce allocation] and I'd like you to lead it.'" - HICS connection*
Equity-stratified data *(Process: Executing)*	*"Another critical component that we evolved during the first surge was the health equity dashboarding . . . .I think it was enormously helpful to force accountability and to show the stark disparity that patients were experiencing" - Command Staff*	*"The [Equity representative] had a team of like three or four right where they're you know, looking at the data, looking at the needs, assessing the gaps you know, facilitating some bigger thinking kind of things like strategies, sessions, forums." - HICS Connection*
Teaming *(Process: Executing)*	*"As we were all moving frantically around trying to figure out how to respond to this dystopian situation caused by the pandemic we still very much wanted to make sure that we continue to center equity, and so we put a group of folks together with a lot of intentionality across the system." - HICS Connection*	*"We came together . . . and if there was someone pulling the strings to this fantastic, it wasn't me. It just seemed like a very organic process . . . " - HICS Connection*
Culture of health equity *(Inner setting: Culture, Implementation climate)*	*"I think that equity issues can be overwhelming, . . . and this is really painful to say this, but it's after George Floyd died, I think a lot of people . . . your receptivity, I think, was changed unfortunately, after this person lost his life." - ER-1*	*"It's [equity] embedded in our culture now . . . , I've been here for 36 years and it's very at the forefront and people support it." - ER*
Barriers		
Clarity of the ER role *(Intervention characteristics: Complexity)*	*"There was definite overlap between [equity] roles . . . I'm very uncomfortable with being the equity rep, I don't know what that means. It's kind of like the kindness rep, does that*	*"It all just began with people getting together and having these conversations, at some point someone gave us titles*

(*Continued*)

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Table 3. (*Continued*)

Theme (CFIR Domain:Construct)	Representative quotes	
	System A	System B
	mean everybody else there isn't kind? . . . there was still a lack of clarity on our parts and so I think what ended up happening actually was that [ER] and I ended up working together closely to try and figure out who's supposed to go to what meeting?"- ER-3	*because it just made sense." - HICS Connection*
Tokenism *(Intervention characteristics: Design)*	*"It makes everybody feel better to have somebody at the table who they think represents equity . . . I think it absolutely gives people a pass, and that certainly wasn't the intention, . . . I think the intention was to make sure that it [equity] was being tended to, and having a brown person at the table, I don't think it's necessarily the right way to do it, but I understand the rationale for it. I think the other issue is that having one person there isn't enough, I happen to be of a clear voice, but you know, it wasn't always easy to speak up."- ER-3*	*"I think the idea is that equity is everyone's responsibility, but somebody needs to communicate to people that it's their responsibility . . . it's not necessarily my problem to fix that, but it's my problem to partner with you so that we can solve it together." - ER*
Competing priorities *(Inner setting: Implementation climate)*	*"I guess I would say It started with tolerance . . . I don't think initially everyone was like, oh, this is fantastic. Thank goodness we're having these equity reports in the middle of our incident command when we've got really important things to do, like we don't have enough PPE for everyone." - Command Staff*	*"Doing what's most efficient or most quick in a crisis situation isn't going to lead to equitable answers. You actually have to be willing to expend extra energy, effort, and resources to make sure you deliver on the equity principle"- HICS Connection*
Insufficient resource allocation *(Inner setting: Readiness for implementation)*	*"There was a larger need that could not have been filled by a small group of people with no budget." - ER-1*	*"I was a little frustrated, telling me that you're supporting this in theory. I want the financial support but I recognize how important it is to have leaders say this is important because then at least you can mobilize the resources and then you figure out how to pay for it." - HICS Connection*
Lack of preparedness *(Process: Planning, Execution, Reflecting, and evaluating)*	*"We realized that we needed to have a better handle on it [equity]. We made it a priority to have that data and to have that representation. I almost feel the reaction was like we should already have had this in place, so we wanted to catch up and get there as quickly as possible." - Command Staff*	*"We built the plane and flew it at the same time." - HICS Connection*

communicated a lack of power and importance to the role. Both sites provided some financial resources, but there was also a perception that leadership support was largely "theoretical," which left people scrambling for resources or donating their own time or money.

Barrier: Lack of preparedness

There was no pre-planning around equity, and sites began the pandemic response by implementing their pre-established HICS structure. The HICS response began with everyone running on "fear and emotion," but within weeks, they recognized the need to embed equity after seeing inequities in infection rates and morality. Implementation was rapid, and the HICS constantly iterated to keep up with the most pressing issues. Participants expressed that it would have been more organized if health equity had already been built in, such as a defined equity representative role and equity as a standing item on the agenda and after-action review.

Discussion

This study explored how 2 health systems incorporated health equity in implementing the HICS during the COVID-19 pandemic. The interventions' primary strategy was adding an equity representative who advised the incident commander and led many equity-promoting efforts. The systems took different approaches, with System A being more internally focused, formal, and data-driven; and System B being more community-focused, informal, and diffuse, partnering with many external organizations. Despite the differences, both systems took several actions to reduce barriers related to the social determinants of health to advance health equity. Their approaches demonstrated feasibility in the context of the COVID-19 response.

The facilitators identified in this study mirror the new leadership standards released by the Joint Commission to reduce health disparities.[35] The new standards require a leader focused on equity efforts, assessing patients' needs and the social determinants of health, collecting and reviewing equity-stratified data, and developing action plans and goals around health equity. These standards can be adapted for the HICS and written into emergency preparedness plans and policies. In addition, health systems can begin to strengthen strategic relationships with the community and other organizations while building a culture of health equity in their organization with learning sessions, messages from leadership, and training. Centering equity in day-to-day operations primes systems to provide equitable care in a disaster.

Thoughtful planning can mitigate many of the barriers identified in this study, such as reviewing previous disaster responses for gaps in health equity and revising emergency plans to address these gaps. In addition, systems can add an equity representative in their HICS, with the role clearly defined using a Job Action Sheet, which was created based on the interviews as a template for systems (Supplementary Material 2). Including equity representatives in disaster training and drills provides necessary knowledge about emergency management and builds relationships with other members of the HICS. To avoid tokenism, the HICS should include multiple equity roles with clear messaging from the

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incident commander that equity is everyone's responsibility, and leaders should seek diverse representation to provide a variety of perspectives.

To our knowledge, there is little research on this topic. Before beginning this work, we conducted a background literature review and found 3 themes that align with the approaches used by these health systems: embedding equity specialists in the HICS, modifying systems to promote equity, and sensitivity to the local community.[36] There is a need for future research on this topic, including the critical role of context, with both health systems taking slightly different but seemingly effective approaches to incorporate equity in their HICS. Further efforts are needed to measure the effectiveness of individual components so those can be priorities for widespread adoption and to evaluate the perception of the community on the success of these efforts. Even without these measures, the cases described in this study can serve as a starting point for changes to national policies while providing flexibility for organizations to adapt approaches to their local context. Regulatory bodies can consider incorporating health equity into the HICS structure and training materials and make similar changes to ICSs for other sectors, expanding the potential to advance health equity in all aspects of the disaster response.

Limitations

A limitation of this study was its design as a case comparison study, which was chosen to capture the nuances of implementation; however, the cases selected had similarities that may limit generalizability, especially for smaller community hospitals or rural settings. This study only captured experiences from 2 health systems; there may have been other novel approaches that were not explored. In addition, this study examines approaches used in the context of the COVID-19 pandemic, which differed from other disaster responses because it was a novel virus, with changes as medical knowledge evolved. It also required an unusually prolonged response that lacked nationally coordinated guidance.[21,37] Still, many participants believed their changes would apply to other disasters with some adaptation. Finally, despite a high degree of perceived success, this study did not evaluate health outcomes to assess effectiveness. Currently, measures for equity in disaster preparation, response, or recovery are not formally defined or routinely collected and it would be difficult to determine the effectiveness of specific interventions because of the complexity of social systems and the absence of a 1-to-1 correspondence between an intervention and health equity indicators.[38] Even without direct outcomes, the cases described took several actions to address the different needs in their community, which moved them closer to an equitable response than without these efforts.

Conclusions

Centering health equity in the HICS is essential in advancing health equity in disasters. Building health equity into emergency planning is more critical now than ever, with a predicted increase in natural disasters from climate change, most of which will disproportionately impact historically marginalized populations.[39,40] Applying lessons from the cases described provides a starting point for others to build health equity into their emergency preparedness plans and work toward achieving an equitable disaster response.

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/dmp.2024.20

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References

1. **Kawachi I, Subramanian SV, Almeida-Filho N.** A glossary for health inequalities. *J Epidemiol Community Health.* 2002;56(9):647-652. doi: 10.1136/jech.56.9.647
2. **Sevelius JM, Gutierrez-Mock L, Zamudio-Haas S, *et al.*** Research with marginalized communities: challenges to continuity during the COVID-19 Pandemic. *AIDS Behav.* 2020;24(7):2009-2012. doi: 10.1007/s10461-020-02920-3
3. **King County Department of Health**. Considerations for groups impacted by inequity. June 4, 2018. Accessed April 29, 2021. https://kingcounty.gov/depts/health/emergency-preparedness/Community-Resilience-Equity/integration.aspx
4. **Nomura S, Parsons AJQ, Hirabayashi M, *et al.*** Social determinants of mid- to long-term disaster impacts on health: a systematic review. *Int J Disaster Risk Reduct.* 2016;16:53-67. doi: 10.1016/j.ijdrr.2016.01.013
5. **Kroll-Smith S.** *Recovering Inequality: Hurricane Katrina, the San Francisco Earthquake of 1906, and the Aftermath of Disaster (The Katrina Bookshelf).* University of Texas Press; 2018.
6. **DeBruin D, Liaschenko J, Marshall MF.** Social justice in pandemic preparedness. *Am J Public Health.* 2012;102(4):586-591.
7. **Magesh S, John D, Li WT, *et al.*** Disparities in COVID-19 outcomes by race, ethnicity, and socioeconomic status: a systematic-review and meta-analysis. *JAMA Netw Open*. 2021;4(11):e2134147. doi: 10.1001/jamanetworkopen.2021.34147
8. **Fonseca VA, Smith H, Kuhadiya N, *et al.*** Impact of a natural disaster on diabetes: exacerbation of disparities and long-term consequences. *Diabetes Care.* 2009;32(9):1632-1638. doi: 10.2337/dc09-0670
9. **Mack D, Rust GS, Baltrus P, *et al.*** Using appendiceal perforation rates to measure impact of a disaster on healthcare system effectiveness. *South Med J.* 2013;106(1):82-88. doi: 10.1097/SMJ.0b013e31827c5a0c
10. **National Council on Disability**. The impact of Hurricanes Katrina and Rita on people with disabilities: a look back and remaining challenges. Published online August 3, 2006. Accessed February 29, 2024. https://files.eric.ed.gov/fulltext/ED496270.pdf
11. **Maness SB, Merrell L, Thompson EL, *et al.*** Social determinants of health and health disparities: COVID-19 exposures and mortality among African American people in the United States. *Public Health Rep.* 2021;136(1):18-22. doi: 10.1177/0033354920969169
12. **California Emergency Medical Services Authority**. Hospital Incident Command System Guidebook. Published online 2014. Accessed April 30, 2021. https://emsa.ca.gov/wp-content/uploads/sites/71/2017/09/HICS_Guidebook_2014_11.pdf
13. **Goralnick E, Serino R, Clark CR.** Equity and disasters: reframing incident command systems. *Am J Public Health*. 2021;111(5):844-848. doi: 10.2105/AJPH.2021.306171
14. **US Department of Homeland Security**. What is the National Incident Management System (NIMS)? Accessed April 30, 2021. https://www.fema.gov/pdf/emergency/nims/nimsfaqs.pdf
15. **Moynihan DP.** The network governance of crisis response: case studies of incident command systems. *J Public Adm Res Theory.* 2009;19(4):895-915. doi: 10.1093/jopart/mun033
16. **University of Washington**. What is implementation science? Accessed December 4, 2023. ~https://impsciuw.org/implementation-science/learn/implementation-science-overview/#:~:text=Implementation%20science%20is%20the%20scientific,use%20by%20practitioners%20and%20policymakers
17. **Nilsen P, Bernhardsson S.** Context matters in implementation science: a scoping review of determinant frameworks that describe contextual

determinants for implementation outcomes. *BMC Health Serv Res.* 2019;19(1):189. doi: 10.1186/s12913-019-4015-3
18. **Nowell B, Steelman T, Velez A-LK, *et al.*** The structure of effective governance of disaster response networks: insights from the field. *Am Rev Public Adm.* 2017;48(7):027507401772422. doi: 10.1177/0275074017724225
19. **Moynihan DP.** Combining structural forms in the search for policy tools: incident command systems in U.S. crisis management. *Governance.* 2008;21(2):205-229. doi: 10.1111/j.1468-0491.2008.00395.x
20. **Eze N.** Driving health equity through diversity in health care leadership. *NEJM Catal Innov Care Deliv.* October 20, 2020.
21. **Administration for Strategic Preparedness and Response**. The effect of COVID-19 on the Healthcare Incident Command System. Published online September 1, 2021. Accessed September 5, 2022. https://files.asprtracie.hhs.gov/documents/aspr-tracie-the-effect-of-covid-19-on-the-healthcare-ics.pdf
22. **KFF.** COVID-19 risks and impacts among health care workers by race/ethnicity - Issue Brief - 9583 | KFF. Accessed December 4, 2023. https://www.kff.org/report-section/covid-19-risks-and-impacts-among-health-care-workers-by-race-ethnicity-issue-brief/
23. **Braverman P, Arkin E, Orleans T, *et al.*** *What Is Health Equity? And What Difference Does a Definition Make?* Robert Wood Johnson Foundation; 2017.
24. **National Academies of Sciences, Engineering, and Medicine.** Health and Medicine Division; Board on Population Health and Public Health Practice; Board on Health Sciences Policy; Committee on Evidence-Based Practices for Public Health Emergency Preparedness and Response. In: Downey A, Brown L, Calonge N, eds. *Evidence-Based Practice for Public Health Emergency Preparedness and Response*. National Academies Press (US); 2020. doi: 10.17226/25650
25. **Brownson RC, Kumanyika SK, Kreuter MW, *et al.*** Implementation science should give higher priority to health equity. *Implement Sci.* 2021;16(1):28. doi: 10.1186/s13012-021-01097-0
26. **Tong A, Sainsbury P, Craig J.** Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *Int J Qual Health Care.* 2007;19(6):349-357. doi: 10.1093/intqhc/mzm042
27. **Damschroder LJ, Aron DC, Keith RE, *et al.*** Fostering implementation of health services research findings into practice: a consolidated framework for advancing implementation science. *Implement Sci.* 2009;4:50. doi: 10.1186/1748-5908-4-50
28. **Kirk MA, Kelley C, Yankey N, *et al.*** A systematic review of the use of the Consolidated Framework for Implementation Research. *Implement Sci.* 2016;11:72. doi: 10.1186/s13012-016-0437-z
29. **Saunders B, Sim J, Kingstone T, *et al.*** Saturation in qualitative research: exploring its conceptualization and operationalization. *Qual Quant.* 2018;52(4):1893-1907. doi: 10.1007/s11135-017-0574-8
30. **Centers for Disease Control and Prevention**. About Social Determinants of Health (SDOH). March 10, 2021. Accessed November 10, 2022. https://www.cdc.gov/socialdeterminants/about.html
31. **Fereday J, Muir-Cochrane E.** Demonstrating rigor using thematic analysis: a hybrid approach of inductive and deductive coding and theme development. *Int J Qual Methods.* 2006;5(1):80-92. doi: 10.1177/160940690600500107
32. **CFIR Guide.** CFIR Interview Guide Tool. Accessed October 1, 2022. https://cfirguide.org/guide/app/#/
33. **Lincoln YS, Guba EG.** But is it rigorous? Trustworthiness and authenticity in naturalistic evaluation. *New Dir Program Eval.* 1986;1986(30):73-84. doi: 10.1002/ev.1427
34. **Edmondson AC.** Teamwork on the Fly. Harvard Business Review. Published online April 1, 2012. Accessed July 2, 2023. https://hbr.org/2012/04/teamwork-on-the-fly-2
35. **The Joint Commission**. New requirements to reduce health care disparities. June 20, 2022. Accessed November 13, 2022. https://www.jointcommission.org/-/media/tjc/documents/standards/r3-reports/r3_disparities_july2022-6-20-2022.pdf
36. **Moyal-Smith R, Barnett DJ, Toner ES, *et al.*** Embedding equity into the Hospital Incident Command System: a narrative review. *Jt Comm J Qual Patient Saf.* 2024;50(1):49-58. doi: 10.1016/j.jcjq.2023.10.011
37. **Haffajee RL, Mello MM.** Thinking globally, acting locally - the U.S. response to Covid-19. *N Engl J Med.* 2020;382(22):e75. doi: 10.1056/NEJMp2006740
38. **Finucane ML, Warren May L, Chang J.** A scoping literature review on indicators and metrics for assessing racial equity in disaster preparation, response, and recovery. RAND Corporation; 2021. doi:10.7249/RRA1083-1
39. **National Wildlife Federation**. Climate change, natural disasters, and wildlife. Published online November 2019. Accessed April 1, 2023. https://www.nwf.org/-/media/Documents/PDFs/Environmental-Threats/Climate-Change-Natural-Disasters-fact-sheet.ashx
40. **Mazdiyasni O, AghaKouchak A.** Natural disasters are prejudiced against disadvantaged and vulnerable populations: the lack of publicly available health-related data hinders research at the cusp of the global climate crisis. *Geohealth.* 2020;4(1):e2019GH000219. doi: 10.1029/2019GH000219