

Qualitative Assessment of a Novel Efficacy-Focused Training Intervention for Public Health Workers in Disaster Recovery

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ABSTRACT

Objective: We trained local public health workers on disaster recovery roles and responsibilities by using a novel curriculum based on a threat and efficacy framework and a training-of-trainers approach. This study used qualitative data to assess changes in perceptions of efficacy toward Hurricane Sandy recovery and willingness to participate in future disaster recoveries.

Methods: Purposive and snowball sampling were used to select trainers and trainees from participating local public health departments in jurisdictions impacted by Hurricane Sandy in October 2012. Two focus groups totaling 29 local public health workers were held in April and May of 2015. Focus group participants discussed the content and quality of the curriculum, training logistics, and their willingness to engage in future disaster recovery efforts.

Results: The training curriculum improved participants' understanding of and confidence in their disaster recovery work and related roles within their agencies (self-efficacy); increased their individual- and agency-level sense of role-importance in disaster recovery (response-efficacy); and enhanced their sense of their agencies' effective functioning in disaster recovery. Participants suggested further training customization and inclusion of other recovery agencies.

Conclusion: Threat- and efficacy-based disaster recovery trainings show potential to increase public health workers' sense of efficacy and willingness to participate in recovery efforts. (*Disaster Med Public Health Preparedness*. 2016;10:615-622)

Key Words: disaster, recovery, efficacy, training, public health

Local public health agencies (LPHAs) play a critical role within the public health preparedness system.¹ After a public health emergency or disaster, LPHAs must take on a diverse array of activities to rebuild their communities as they resume their day-to-day responsibilities. In this challenging context, LPHA workers must remain not only able but willing to report to work. Prior research suggests that optimizing such desired behaviors in the face of uncertain hazards is affected by perceptions of risk, fear, threat, and efficacy.²⁻⁵

Prior studies have found that public health workers' willingness to respond acutely to disasters can be improved through preparedness trainings addressing attitudes to response in a threat and efficacy framework, the Extended Parallel Process Model (EPPM).⁶⁻¹⁰ To our knowledge, however, no peer-reviewed research has been published explicitly assessing disaster or emergency recovery training for public health workers on efficacy or willingness to participate in recovery efforts. This research gap is

salient, as the Federal Emergency Management Agency (FEMA) National Disaster Recovery Framework¹¹ points to disaster recovery operational requirements in public health and health care systems that are distinct from the response phase of the disaster life cycle. Furthermore, to the best of our knowledge, the research literature has yet to explicitly address the relevance and utility of disaster recovery-focused training curricula for public health workers in influencing the perceptions of this critical occupational cohort toward their recovery activities.

Against this backdrop, we developed and delivered a novel, evidence-informed curriculum called the Public Health System Training in Disaster Recovery (PH STriDR), which was designed to boost efficacy (ie, sense of confidence and perceived role-importance) and willingness to participate in disaster recovery. An agency-wide curriculum, PH STriDR, was administered from November 2014 through January 2015 to local public health workers within 5 LPHAs impacted by Hurricane Sandy in Maryland

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and New Jersey. A train-the-trainer model was used in which investigators trained LPHA workers to deliver PH STriDR to their coworkers.

The PH STriDR curriculum, developed by using widely accepted principles of adult learning,^{12,13} adapted the EPPM framework³ with the objective of enhancing efficacy and the willingness to perform recovery work by LPHA workers in public health emergencies and disasters.¹⁻⁵ Three New Jersey and 5 Maryland LPHAs affected by Hurricane Sandy were randomly selected in January 2014 for baseline research, including 2 state-specific focus groups that helped to inform a quantitative needs assessment in those LPHAs in March and April of 2014. The resulting data were used in curricular development between June and October 2014.¹⁴

The training curriculum comprised four 90-minute, interactive, face-to-face sessions (Table 1). The curriculum introduced the concept of community disaster recovery within the recovery continuum as described in the FEMA National Disaster Recovery Framework;¹¹ defined the disaster recovery roles of the LPHA and the individuals who work within it; and explored potential personal, family, and workplace considerations that LPHA workers often face during disaster recovery-phase efforts. Intended for all LPHA employees, the curriculum was designed to foster learner

engagement and professional dialogue among employees at all agency levels through the use of small and large group discussions.

Each LPHA selected staff members to serve as trainers on the basis of their ability to facilitate dynamic group discussions and their comfort in presenting material. Those selected underwent a 1-day, 5-hour training-of-trainers course, held on October 7, 2014, for all trainers in Maryland and on October 14, 2014, for all trainers in New Jersey. A total of 14 Maryland and 3 New Jersey trainers were trained. The total number of LPHA staff members who participated in the agency-wide PH STriDR curriculum that the trainers delivered was 478 from the 3 Maryland LPHAs and 65 from the 2 New Jersey LPHAs. For institutional review board (IRB) reasons and to minimize social desirability bias due to the presence of researchers, the trainings were not monitored by the research team. However, input in post-curricular focus groups suggested fidelity in delivery of the training curriculum and approach.

Qualitative data were used to assess the impacts of PH STriDR on LPHA workers' perceptions toward current and future disaster recovery efforts. Specifically, in accordance with this study's goals, post-curricular focus groups aimed to complete the following: gather data on the perceptions of trainers and trainees about the PH STriDR curriculum's

TABLE 1

Description of Public Health System Training in Disaster Recovery (PH STriDR) Intervention Curriculum

Session	Focus	Learning Objectives
Session 1: Disaster Recovery Activities in the Local Public Health Agency	This session introduces the concept of community disaster recovery and focuses on the role of the local public health agency in the broader system-level recovery effort.	1.1 List various types of natural and human-generated disasters that are likely to occur in your area. 1.2 Identify local public health agency recovery activities for disasters likely to occur in your area.
Session 2: Your Roles and Responsibilities in Disaster Recovery	This session begins to identify workers' individual roles and responsibilities in disaster recovery and how those roles matter to the overall agency recovery effort.	2.1 Describe potential individual job duties in the disaster recovery phase. 2.2 Compare and contrast your day-to-day job activities and your potential disaster recovery activities. 2.3 Discuss ways in which your work and your colleagues' work contribute to the overall recovery effort of the health department.
Session 3: Personal/Family and Workplace Considerations for Disaster Recovery	This session provides learners with the opportunity to reflect on personal/family and workplace considerations that relate to disaster recovery and to identify resources to prepare for these considerations in advance of a disaster.	3.1 Describe common personal and family support issues encountered beyond the first 72 hours of a disaster and resources that can help you prepare in advance. 3.2 Identify resources available to you, your family, and your coworkers to address psychological well-being and self-care. 3.3 State who you may contact if you have questions about workplace safety policy, compensation, and liability in disaster recovery.
Session 4: What Does a Successful Disaster Recovery Look Like?	This session reflects on the previous sessions for the purpose of creating a common vision of successful recovery of the local public health agency and community following a disaster.	4.1 Characterize aspects of successful disaster recovery from your role/function perspective.

content, assess the effects on trainees of PH STriDR training on perceived efficacy and willingness to perform recovery phase activities, and gauge the perspectives of trainers and trainees regarding the implementation of the PH STriDR curriculum.

METHODS

This study used purposive and subsequent snowball sampling techniques¹⁵ to identify and recruit LPHAs in Maryland and New Jersey from the counties and jurisdictions affected by Hurricane Sandy. Two of the New Jersey and 3 of the Maryland LPHAs also participated in the baseline research. Two state-specific focus group discussions (FGDs) were held in April and May 2015 to collect data about the training program from LPHA workers. Focus group participants with diverse occupational roles were recruited with the help of a senior administrative point-of-contact in each LPHA. Individuals participating in PH STriDR as either trainers or trainees were included in intentionally integrated focus groups to enhance the professional diversity of the LPHA workers' perspectives.

A total of 29 LPHA employees from all 5 LPHAs participated voluntarily in the 2 FGDs: 21 in the Maryland focus group and 8 in the New Jersey focus group. Focus group participants represented a broad range of professional roles and local health department recovery-phase responsibilities. The participants self-identified as clerical and support staff, administrative leadership, emergency preparedness personnel, health educators, and clinical workers.

The facilitators of the FGDs used a guide designed to elicit discussion in the following domains: (1) reactions to the PH STriDR curricular content and training methods, (2) perceived changes in willingness to participate in recovery efforts as a result of the training, and (3) perceived changes in self-efficacy (defined as people's perceived ability to influence events that affect their lives¹⁶) and response efficacy (perceived effectiveness of such influencing behaviors³) as a result of the training.

Each FGD was audio-recorded and transcribed. A codebook was developed by using deductive and inductive methods to account for both the project's theoretical framework and issues or concerns expressed by the participants. Two members of the research team modified the codebook in an iterative coding process by using NVivo 10 software¹⁷ to yield systematic and consistent coding and to ensure coder agreement on the interpretation of data.¹⁵ The analytic team used memos to summarize and interpret major themes in the FGD data.

This study was reviewed and approved by the Johns Hopkins Bloomberg School of Public Health IRB, the Uniformed Services University of the Health Sciences IRB, and the Maryland Department of Health and Mental Hygiene IRB.

All 3 boards determined the study to be exempt from the criteria defining human subjects research.

RESULTS

Participants generally responded positively to the PH STriDR curriculum and training structure. Both trainers and trainees found value in focusing on the disaster recovery (as opposed to the response) role of LPHAs. Participants were also positive about undergoing training with colleagues from other subunits and organizational levels within their LPHA. Slight differences in response were observed between the Maryland and New Jersey participants, which will be further characterized below.

Feedback on the PH STriDR Curriculum

Participants consistently stated that the PH STriDR curriculum increased their understanding of the disaster recovery phase of public health work, particularly its timing and scope. The training increased some participants' understanding of the diversity of the disasters that their LPHA might face. Many were surprised that, according to FEMA's National Disaster Recovery Framework,¹¹ recovery work begins while response is ongoing, and some reported that the training made them aware of public health's central role in recovery efforts. In New Jersey, some participants remained focused on response phase experiences during and after Hurricane Sandy rather than on experiences in the recovery phase. Their examples, for instance, of situations where prior STRiDR training would have been beneficial had often occurred days after Hurricane Sandy rather than weeks or months after the event. Trainees and trainers found training in groups with participants from different departments and levels of authority helpful in giving them a better understanding of their organization's operations. Indeed, some participants referred to this as the best feature of the training. Trainees in clerical, support, emergency preparedness, health education, and clinical positions stated that PH STriDR helped them see the value of their own roles and how their functions complemented those of their colleagues. Some in administrative positions wanted more information on protocols for recovery-phase logistics such as paying contractors. Participants found training discussions to be stimulating, but some wanted more interactive and more visual presentations. Trainees felt comfortable with the use of internal trainers and thought that their trust of the curriculum was greater than if external trainers had been used. Some trainers required extra time to study their agency's policies and gather locally relevant course information to properly customize the curriculum, and some in emergency preparedness positions felt themselves more able to offer relevant examples than other trainers without this personal experience. Trainers also asked for tools to be included in the trainer's guide and training of trainers to help them tailor the curriculum to their agencies and make the session presentations more engaging.

Trainees praised session one of the PH STriDR curriculum for building their awareness of the length and scope of recovery-phase operations. Trainers reported the need to occasionally redirect trainee attention from response to recovery. Participants stated that the activity sheet in session two of PH STriDR allowed them to share useful information with each other about their agency roles and how their LPHA fit into overall recovery efforts. Some trainees were reassured to learn their roles in recovery-phase operations would not greatly diverge from their day-to-day responsibilities. Participants thought session three effectively emphasized personal preparedness. It also raised awareness of their agency's chains of command or Continuity of Operations Plan (COOP), which many were unfamiliar with and which some researched after the training. Some participants thought session three lacked resource information tailored to their county. More participants criticized session four of PH STriDR than any other session, calling it redundant and excessively long. Trainers in one LPHA combined sessions three and four for staffing and scheduling reasons, which also cut some of the time devoted to reviewing material in session four. Some trainees, however, found session four valuable as a way to individually and collectively celebrate recovery accomplishments, which previous research has identified as beneficial to perceptions of efficacy among employees.¹⁴

In praising the perceived benefits of training across departments in their agencies, participants suggested that it would have been helpful to train with other local non-public health agencies. Participants thought it was important for their colleagues in other agencies to understand recovery as a continuum and felt that training together would improve interagency coordination in recovery situations. However, it was not possible to discern if there were differences of opinion between administrators and other staff on this point.

Effect of the Curriculum on Willingness to Participate in Disaster Recovery

In both focus groups, investigators made clear that the discussion would focus on recovery phase efforts. Focus group participants spoke at length about their willingness to perform disaster recovery work and their perceived barriers to participation, and most participants in both states were willing to participate in future recoveries. However, in the New Jersey sample, whose jurisdictions were harder hit overall by Hurricane Sandy than those in Maryland, participants tended to recall response situations in the immediate aftermath of Sandy, and a minority expressed reluctance to participate in future efforts based on the severity of their response experiences. Among the Maryland LPHAs, participants expressed a universal willingness to participate in their agency's recovery efforts as a result of the training, and trainers felt that trainees were more prepared after completing PH STriDR. Participants in both New Jersey and Maryland expressed some common concerns but none described situations in which they would

refuse to participate in recovery efforts. In fact, public health was described by some participants as a profession in which overcoming such barriers was an expected part of the job.

Participants tended to view lack of role definition as a barrier, describing a feeling of being "lost" as a challenge in performing their recovery-phase roles. Some expressed concern that in a disaster situation, they would be asked to perform tasks for which they were unqualified or unprepared. Differences existed between the desire of some employees for more role definition in a disaster recovery situation and the views of supervisors, who tended to stress the importance of employees remaining flexible during recovery efforts. Employees in certain positions, eg, clerical, were reassured by training discussions in which it was explained that their responsibilities in a recovery situation would align with their day-to-day nonrecovery roles. Knowing their agencies had a COOP also reassured some LPHA workers that their agencies were prepared to deal with contingencies without placing on them recovery responsibilities beyond their present position description and training. Some participants felt a need for greater clarification of agency policies concerning hazard pay and exemptions from duty based on family or personal considerations during recovery operations. Employees with fewer family obligations expressed a willingness to report if doing so would allow more flexibility to coworkers with more personal or family obligations and concerns.

Effect of the Curriculum on Efficacy Toward Disaster Recovery

The EPPM framework posits that for an individual to adopt a positive adaptive behavior, there must be both a high level of perceived threat and a high level of perceived efficacy.^{3,18} In this model, efficacy is composed of 2 parts: self-efficacy, or the individual's perceived ability to carry out their duties in a particular role, and response efficacy, or the perception that performing this particular role is important and will result in the desired outcome.^{3,19} Analysis of the focus group data yielded evidence that the PH STriDR curriculum enhanced both self-efficacy and response efficacy among participants, as well as a form of group efficacy or "collective efficacy."²⁰

Self-Efficacy

Throughout both focus groups, participants expressed the need for clarity in their duties during disaster recovery. Specifically, participants aired concerns regarding what kinds of duties they might be asked to take on in unusual circumstances and how responsibilities would be assigned in the event that a colleague was unable to perform his or her duties. Some participants said the training allowed them to see the diversity of roles they may be able to fill beyond the usual scope of their duties and where they might "fit" within the recovery context, with clerical workers being an example participants cited frequently. Some perceptual divergences existed within the New Jersey focus group between the desire,

generally expressed by clerical and some clinical workers, to have well-defined roles and responsibilities in recovery situations and the need, expressed by other clinical workers and administrators, for all public health workers to be flexible in the face of changing situations as a condition of their work.

Barriers to self-efficacy included threats to personal safety and the perception of inadequate consideration for the personal challenges that different employees faced in traveling to their place of work during recovery. Additionally, some LPHA workers expressed concern about how decisions were made to call in employees during Hurricane Sandy given the adverse weather conditions and damage to infrastructure. Other employees felt that those with more vulnerable dependents or longer commutes should be allowed more consideration than other workers.

Response Efficacy

Overall, participants stated that participation in the training had increased their perception of the important role their LPHA has in disaster recovery, especially compared to and in coordination with other agencies and private voluntary organizations. Some participants thought the training revealed to them the importance of public health in disaster recovery. To some, public health had a more natural role in recovery compared to, for example, first responders, whose responsibilities are more suited to immediate post-disaster response. A small number, though, felt that public health workers as a whole did not fully grasp their importance in emergency situations in the absence of prior disaster training or exposure to a disaster experience. The PH STriDR training offered participants an opportunity to see how public health contributed to the overall recovery, increasing their sense that their individual roles mattered. Local interagency coordination and training emerged as a way to make the role of LPHAs clearer, for example, by including other agencies in the PH STriDR training program, and highlighted the importance of “formalizing” relationships and agreements between counties and between agencies.

Collective Efficacy

The diversity of roles represented by participants during the PH STriDR training sessions had a powerful effect on their perceptions of collective efficacy as expressed by focus group participants, in particular by increasing trainees’ awareness of the functions performed in their agencies by colleagues with whom they did not normally interact. Moreover, trainees’ awareness of the collective capabilities of their agency to respond to threats in a disaster recovery situation increased. Critically, some participants were not aware, prior to PH STriDR training, that their LPHAs had a COOP and other post-disaster protocols to help guide decision-makers in the event of crisis. Participants cited the need for ongoing agency-wide trainings as a way to increase their understanding of the

overall objectives and functions of the different subunits in their LPHAs in disaster situations.

One barrier to collective efficacy was the perceived high turnover of staff. Although some participants said their department had held drills to practice various responses, some newly hired staff had not participated. In these cases, the PH STriDR training had been beneficial to these newer employees by helping them learn what their roles might be and what to expect during a disaster recovery. In at least one LPHA, Ebola response efforts prevented most nurses from attending the PH STriDR training. Participants in that training felt that the absence of nurses diminished their understanding of how nurses’ roles would contribute to their agency’s overall disaster recovery efforts.

DISCUSSION

This qualitative assessment provided an opportunity to analyze the mechanisms that bring about changes among public health recovery workers in their willingness to perform recovery work, as well as their perceptions of self-efficacy, response efficacy, and their agency’s collective efficacy. Focus group data suggested that this training helped to increase participants’ understanding of the importance of the functions of LPHAs in the context of disaster recovery, which also increased participants’ sense of self-efficacy and response efficacy, as well as collective efficacy. Previous research has revealed that increased efficacy is an influential positive modifier of willingness to respond for public health workers in the context of disaster response.⁹ Efficacy is also a key predictor of actual response among public health workers in a disaster.⁷ Although the links between efficacy and willingness to participate in response and recovery situations appear to be analogous, further research is needed to measure the actual impact of efficacy, including collective efficacy, on the willingness of public health workers to participate in recovery efforts.

This study, to the best of our knowledge, is the first to address whether training in disaster recovery affects public health workers’ perceived efficacy in recovery situations and what barriers remain that affect LPHA workforce attitudes toward recovery participation. Past studies offered evidence that training in emergency response can affect willingness to respond by increasing participants’ sense of efficacy, as these data suggest for PH STriDR. Training in radiological preparedness, for example, was recently shown to increase willingness to respond among nuclear medicine technologists.²¹ Another study found that a lack of adequate training was to blame for medical students avoiding response and provision of emergency resuscitative care.²² The most convincing evidence comes from the public health disaster response literature, where one study suggests that an emergency response curriculum can positively influence efficacy as a critical determinant of response-phase willingness.¹⁹

Our study suggests that the PH STriDR curriculum, by explaining and clarifying roles and expectations both for individual staff and collectively for LPHAs, has the potential to positively affect the perceived efficacy of LPHA workers in public health disaster recovery-phase operations.

Focus group participants also suggested that the PH STriDR training provided them with a forum in which to discuss and better understand the range of roles performed within their LPHA, which increased their perception of the collective efficacy of their agency in disaster recovery. As conceptualized by Bandura, collective efficacy is an emergent property defined as a group's shared belief in its ability to produce desired results.²⁰ This is gauged by both the group's appraisal of members' abilities to perform their individual duties and by the group's appraisal of the group as a whole to carry out its collective duty. While a sense of collective efficacy does not invariably lead to actual increases in organizational efficacy, it has been shown in some contexts to increase group motivation, resilience, and performance.²⁰ Collective efficacy is not usually considered a part of the EPPM model, but given the institutional context in which most local public health workers operate, it could prove to be an important element in boosting their willingness to participate during recovery-phase efforts. More research is needed, however, to better understand the effects that such trainings can have on perceptions of collective efficacy. It is also important to separate the perception of collective efficacy from actual organizational efficacy, which can be affected by myriad factors.²⁰

The study also revealed factors that reduce LPHA workers' willingness to participate in recovery efforts. Lack of confidence in one's own personal safety while traveling to work was the most pronounced barrier among the focus group participants. Another important barrier was the perceived lack of definition of employee roles and responsibilities in recovery situations, and the importance of establishing policies to guide the expectations of employees and supervisors in those contexts. LPHA policies and training programs should take these factors into consideration in anticipation of future disaster recovery-phase operations.

The FGDs allowed trainers and trainees to offer thoughts on the content and give feedback on the administrative aspects of PH STriDR implementation. In recognition of the challenges that trainers faced in tailoring the PH STriDR curriculum to their agencies, future versions of the curriculum could provide tools or frameworks to ensure that local customization can be performed without changing the core of the curriculum. Additional guidance should be given on factors to consider in scheduling the sessions to assist trainers and administrators in balancing the goal of attaining optimal retention of training content with the logistical demands of convening employees across diverse LPHA departments. Factors to consider would include scheduling to coincide with

standing meeting slots, intentionally distributing the curriculum over the span of several weeks instead of several days to allow for more curriculum delivery time, being mindful of department workflow considerations that may vary by time of year, and approaching scheduling with overall flexibility. Particular consideration should be given to eliminating perceived redundancies in sessions three and four, potentially by their combination, to retain important personal preparedness material in session three and motivational messaging in session four. Developing Job Action Sheets for recovery tasks with participants could improve trainees' response to the final sessions.

In approaching the training, trainers should also be prepared to anticipate the anxiety that LPHA workers face in fulfilling their agency roles in the uncertain context of a disaster recovery situation, particularly in the early phases when recovery and response efforts may be concurrent. A balance has to be struck between clarifying employees' specific tasks and responsibilities and preparing LPHA workers to be flexible in their expectations given the staffing and logistical challenges inherent in any disaster situation.

Although this study suggests a positive impact of the PH STriDR curriculum on the attitudes and perceptions of public health workers toward disaster recovery, further research is required to evaluate whether a threat- and efficacy-based training model would be effective in changing attitudinal determinants among other non-public health personnel involved in recovery per the National Disaster Recovery Framework,¹¹ such as those in the health care (eg, hospitals) and business sectors.

Limitations

The main limitations of the present study related to the exploratory nature of a pilot training program. The potential for researcher bias in the qualitative analysis presented here was addressed through the use of an analysis team and an iterative comparison coding procedure. The pool of potential participants was limited owing to the implementation of PH STriDR as a pilot training program, and LPHA staff recruited the participants of the focus groups by means of a convenience sample, which may have introduced social desirability and self-selection bias into the process. Conducting a focus group with 21 participants presented the challenge of maintaining an active and balanced discussion. The moderator used engagement techniques to elicit contributions from all participants in an effort to counteract this limitation. Because focus groups mixed trainers and supervisors with trainees and employees, deference may have dulled the expression or strength of training and agency critiques. However, recruiting participants from different LPHAs and from a diversity of disaster recovery roles generated patterns of data that could be more widely applicable for future curricular and policy interventions, and

the transcripts indicated a level of rapport and camaraderie among the participants across roles.

CONCLUSIONS

Given the wide variety of potential disaster events faced by LPHAs, the development of effective and efficient training methods for preparing public health workers for their roles in disaster recoveries is a critical need, particularly in light of the importance and duration of recovery efforts as revealed by recent catastrophic events. Trainings based on an EPPM framework, such as this one, can improve the willingness of LPHA workers to participate in recovery efforts by increasing their overall sense of efficacy in the face of long-term post-disaster challenges. This study demonstrated a positive impact of the PH STriDR curriculum on improving LPHA participants' understanding of the importance of the recovery phase, their appreciation of the value of their individual roles, and their awareness of the complementary nature of the diverse units and individuals in their agency in helping their communities recover from a disaster such as Hurricane Sandy. In the interest of improving efficacy perceptions among employees and improving disaster recovery efforts, LPHA leaders should consider developing organizational policies and instituting training to clarify roles and expectations across their agencies by explaining the importance of individual and agency recovery efforts, perhaps by developing Job Action Sheets for recovery tasks. Efforts should be made to develop and study threat- and efficacy-based recovery training for use among key recovery personnel in other local agencies and institutions involved in disaster recovery.

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