Title: Employer Preparedness: A Total Worker Health® Conceptual Framework and Model
Running Title: Employer Preparedness

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Abstract:
Background: Recent disasters have demonstrated gaps in employers' preparedness to protect employees and promote their well-being in the face of emergencies and disasters affecting the workplace and their communities. Total Worker Health (TWH), a comprehensive perspective developed by the National Institute for Occupational Safety and Health, is a helpful framework for addressing employer preparedness. It includes attention to health and safety at work, and the promotion of the health and well-being of the employee in the context of social determinants of health, such as work-life balance.
Methods: TWH concepts, including the domains of TWH and the TWH Hierarchy of Controls, were investigated for their relevance to protecting employees and promoting their well-being during and after crises such as weather disasters, pandemics, and acts of terrorism. Building upon TWH concepts, an employer preparedness framework and model is proposed.
Findings: The Model emphasizes upstream prevention, workplace-community linkages, social and economic impacts, and employer leadership through a cyclical planning process.
Conclusions/Application to Practice: The Model can assist employers in advancing their preparedness for all hazards through self-assessment and planning agendas based upon the proposed domains.

Keywords: Employer Preparedness, health and safety, emergencies and disasters, planning, Total Worker Health

Background

In 1911, 146 factory workers lost their lives in the Triangle Shirtwaist fire in New York City. While the immediate cause of the disaster was the fire, what made it a true disaster was an unsafe building, locked exits, fire hazards, and lack of concern for employee welfare (U.S. Occupational Safety and Health Administration, 2011). Since that time, extensive regulations have been promulgated to assure adequate building safety, emergency rescue services, and compensation for disabled workers. The US Occupational Health and Safety Administration (OSHA), Environmental Protection Agency, and Departments of Homeland Security and Transportation all have hazard-specific emergency planning requirements and resources to protect employees and communities. However, recent massive unpredicted natural and human-caused disasters, including the COVID-19 crisis, have sharpened awareness that many employers are unprepared to protect employees or respond in ways that promote employee well-being in the face of these disasters (Carole Edson, NEHRA, personal communication, September 15, 2017; Maurer, 2014). Additionally, government agencies may not have adequate resources, such as personnel protective equipment reserves, or management tools such as remote working policies, to address disasters affecting workplaces (Lochhead, 2017; Phillips, 2017; Siegal, 2018). Despite significant improvements since the days of factories without emergency exits, there is still a need for greater attention to disaster preparedness with regard to the workplace.

Total Worker Health® As the Basis of the Framework

The purpose of this work was to develop a conceptual model of Employer Preparedness based on the National Institute for Occupational Safety and Health's (NIOSH) Total Worker Health® (TWH) framework. TWH is defined as "policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being" (Lee, MP et al., 2016). TWH recognizes that work is a multifaceted determinant of health and that workers face risk factors inside and outside of work that impact their health and their experience at work (Eakin, 1997; A. L. Schill, 2017). TWH evolved in response to the need to address the growing burden of chronic disease in working populations and a desire to integrate efforts to promote individual employee health with worker protection from workplace hazards (Punnett, 2009). In drawing attention to the full range of determinants of worker well-being, from exposure to chemical hazards to access to healthy food, TWH facilitates the destruction of organizational silos that prevent an integrated and comprehensive approach to worker well-being.

The TWH orientation is helpful for promoting worker well-being in the face of emergencies and disasters. Emergencies and disasters impact individuals as workers, family members, and residents of impacted communities (Benach et al., 2019; Casey et al., 2020). Work is both a venue and a system that organizes time, purpose, and resources. Work disruptions and demands during disasters and emergencies have profound impacts on individuals coping with other disrupted venues and systems that support their daily lives (Crane et al., 2014). While this expansive perspective introduces new complexities, it recognizes the fundamental reality that boundaries between "occupational health" and "community health" are ordinarily blurry and, perhaps, especially so during emergencies and disasters.

Expanding the Framework to All Hazards, All Impacts

Disasters such as pandemic infectious diseases, severe weather events, acts of terrorism, and chemical spills pose challenges to employers in many respects, including the protection of the well-being of their employees. These events, unfortunately, are becoming more common, and yet they remain unpredictable and, generally, unanticipated (Keim, 2008). While these events have dramatically different dimensions, their common disruptive nature allows for a preparedness approach that can be

comprehensive of "all hazards." While some hazards are region-specific, many, such as acts of violence, can strike anywhere. Weather events will take different forms in different areas of the country, however extreme precipitation, heat waves, and wind events, are anticipated to become more frequent and severe in many regions of the US (U.S. Global Change Research Program, 2017). Thus, while Employer Preparedness must necessarily be tailored by geography, all employers can recognize that emergency planning applies everywhere.

The COVID-19 crisis has demonstrated the challenges of protecting employees in the face of these disasters. "Essential workers," many of them low-paid immigrants without health insurance, have been recognized as de facto "heroes" given the fact that they face the hazard of COVID 19 at work in workplaces that struggle to provide safe conditions and adequate personal protective equipment (PPE) (Dyal et al., 2020; Kane, 2020). Even healthcare institutions, which could be considered the best prepared, faced severe shortages of PPE, staff, meals for staff working long hours, childcare, and respite for the dramatic mental health challenges faced by employees (Chin et al., 2020; Nelson & Kaminsky, 2020). Indeed, workers appealed directly to their communities for these basic necessities to do their jobs, including moral support (Science Friday, 2020). There are many lessons yet to be learned and incorporated into future pandemic preparedness, however it is already clear that the COVID-19 pandemic has laid bare the importance and the challenges facing employers in keeping their workers safe and able and willing to work, and therefore also, protecting society from the worst impacts of the crisis (Abelson, 2020).

The Impacts of Disasters on Workers

The Houston, Texas Arkema Chemical Plant explosions, which occurred during Hurricane Harvey in 2017, provide an example of how a severe weather event can impact at least three groups of workers: plant personnel, emergency responders (several of whom were hospitalized), and workers living near the plant (Newkirk II, 2017). Arkema is a global company, like many in Houston. Thus, a fourth group of impacted employees includes those who are attached to impacted companies, even if they work in another continent. Thus, disasters place demands on employers of each of these groups address the safety of their work environments, as well as processes for determining how their employees have been impacted outside of the work context. The availability of employees for work given those impacts, and their immediate and long-term health and disability needs, are among the holistic concerns facing employers impacted by a disaster. The Arkema/Hurricane Harvey case illustrates that preparation for all-hazard events should likely include assessment, communication, and readiness to deploy resources to assure both operational continuity and the well-being of employees.

Lack of employer planning may coincide with high public and employer expectations for workers to work during disasters ("Workers Rescued From North Carolina Business Flooded by Rain," 2018). For example, Waffle House restaurant employees were expected to remain during Hurricane Florence in North Carolina, despite evacuation orders, in part, to provide meals to emergency personnel (Gant & Tenney, 2018). Whether and how to evacuate institutionalized populations impacts all those responsible for their security and care (Chakraborty, 2018). The motto: "Neither snow nor rain nor heat nor gloom of night stays these couriers from the swift completion of their appointed rounds" may not reflect adequate concern for postal service employee welfare in the face of deadly heat and other environmental hazards. In fact, in 2012 following the death of a mail carrier due to heat, the U.S. Postal Service was cited by OSHA for failing to plan to protect employees from a well-recognized hazard (Smith, 2013). While broader changes in policy and culture may be required to spur action to protect workers, in the interim, human resources (HR) professionals have noted gaps in Employer Preparedness and

developed guidance aimed at assisting employers in filling them (Bruce, 2012; Society for Human Resource Management, 2014).

Disaster-related physical and psychological hazards in and beyond the workplace include transportation challenges, shift work and overtime, exposure to the elements and hazardous agents, building safety, traumatic events, and stress from work/family conflicts (Dan & Kohiyama, 2017). In addition to direct effects on their health and well-being, employees may also face grief and stress, damaged homes and vehicles, and the need to care for family members. Reporting from North Carolina during Hurricane Florence included this relevant description of a nursing home worker's experience:

> *"When I was walking out my back door, the water was already coming in my front door," she said. She left her flooded apartment for her shift at a nursing home. It was a particularly hectic shift, since residents of another nursing home had been brought to this one, while some of her co-workers were dealing with their own flooded homes. She worked on Thursday, spent the night at the home, and is back at work until Friday afternoon. When the shift ends, she hopes to go get her children, whom she has not heard from for more than a day. Her grandmother has no power and no cellphone, and is in a part of town with water in the streets. "I don't have nothing but the clothes that I had on yesterday" (NYTimes Staff Reporters, 2018).*

Older workers and those with underlying health conditions or disease risk factors are particularly vulnerable to injury and illness during and following extreme events (Silver, 2020). For example, employees that use some medications and/or are chronic disease sufferers are less likely to be able to work safety at elevated temperatures (Dyal et al., 2020; Gamble et al., 2016). The needs of employees with limited English-language skill or disabilities must be considered as part of inclusive emergency and disaster planning.

Many employers already utilize strategies and resources such as pre-employment health screening, standardized shifts, Employee Assistance Programs, childcare assistance, personal leave, occupational health nursing and medical management, health and safety management programs, wellness programs, and rideshares to meet their day-to-day objectives for enhancing or maintaining the safety and well-being of their employees. These support programs may well be utilized in service of, or adapted for, employer emergency preparedness. For example, wellness programs might feature employee training on personal disaster preparedness and the assembly of "go kits" which are helpful in the event of a community evacuation. However, the extent of adaptation of existing programs is not known.

Efforts to Mitigate Impacts

Following the recognized physical and mental health impacts on World Trade Center disaster emergency responders and clean-up workers, greater attention has been paid to the protection of frontline workers during and following emergency events (Liu et al., 2014; Reibman et al., 2016). Public agencies have invested in planning, training, PPE, protocols, medical surveillance, and specialized mental health services related to disasters (NIOSH, 2017). Led by the National Institute for Environmental Health Sciences Worker Training Program, federal response to incidents involving hazardous materials, such as the Deepwater Horizon explosion, include new attention to the protection of both government and contract employees (Michaels & Howard, 2012). Training efforts have been made by immigrant worker centers to reach the vast numbers of "muck and gut" workers (often day laborers or casually employed workers) who respond to needs of homeowners and businesses to clean up and rebuild post-disaster (Cuervo et al., 2017; Delp et al., 2009). The protection of front-line healthcare workers gained new attention during the COVID-19 crisis, but it's importance had been well demonstrated during the Ebola

threat several years before (Baron et al., 2009; Kasperkevic, 2014; Wizner et al., 2016). There have been no published studies of Employer Preparedness and response outside of these sectors, despite the potential impacts on diverse sectors and work environments.

OSHA's safety standards related to emergency preparedness, such as 29 CFR 1910.38(a) and 29 CFR 1926.35, require written Emergency Action Plans when certain other standards, such as the Process Safety Management standard, apply. The minimum requirements of these plans are fairly narrow: procedures for reporting emergencies, evacuation, and for safety of rescue and critical operations employees. An "employee alarm system," and training program are also required. Not many workplaces are required to have emergency action plans, but OSHA suggests that "emergency preparedness is a well-known concept in protecting workers' safety and health." OSHA emergency preparedness requirements are not adequate to assure a comprehensive TWH approach, including hazard reduction and help for employees get back to work.

Many of OSHA's health and safety standards and best practices guidance are designed to mitigate both the usual and the unusual hazards employee may face. Employers who have a well-developed safety culture and comprehensive health and safety management, including adopting best practice guidance where there is no official standard (such as in the case of violence prevention), may be better prepared to protect employees in the face of emergencies and disasters. However, the HR component of TWH Employer Preparedness, including pay and leave policies, is also necessary so that preparedness includes measures to assure workers' economic and social well-being.

Methods

The proposed model of TWH Employer Preparedness was developed from scrutiny of the concepts of TWH as described by the NIOSH TWH program and the work of the Centers of Excellence for TWH and their application to the goals of promoting health and well-being during and following disasters (A. L. and L. C. C. Schill, 2013). The domains of the NIOSH TWH model and the TWH Hierarchy of Controls are examined in light of the author's interpretation of the relevant potential impacts related to emergencies, crises and disasters that impact workers' health and well-being. These interpretations are then condensed into a model and framework with illustrative examples to propose a flexible and comprehensive approach that employers can operationalize to advance their preparedness.

Findings

Applying TWH to Employer Preparedness

Table 1 highlights the core components of NIOSH's TWH domains and provides examples of TWH issues that have I have interpreted to have particular relevance for Employer Preparedness. For example, in the first category of "Control of Hazards and Exposures," Employer Preparedness considers control of exposures during unanticipated events such as weather-related disasters. There may be hazards that would only exist during an emergency or disaster, and employers may need to consider what can be handled by their own staff and what would require outside assistance of emergency responders and hazardous materials specialists. Risk assessment is highlighted here as we recall that Hurricane Harvey overwhelmed the Arkema Chemical plant's chemical safety controls resulting in widespread chemical exposures.

Table 1: Employer Preparedness and Total Worker Health®

TWH® Domain	TWH® Issues with Particular Relevance for Employer Preparedness
Control of Hazards and Exposures	Chemical Exposure Safety Risks Risk Assessment and Risk Management
Organization of Work	Fatigue and Stress Prevention Safe Staffing Overtime Management Flexible Work Arrangements Adequate Meal and Rest Breaks
Built Environment Supports	Access to Healthy, Affordable Food Options Universal Design
Leadership	Commitment to Safety, Health, and Well-Being Meaningful Work and Engagement Worker Recognition and Respect
Compensation and Benefits	Adequate Wages and Prevention of Wage Theft Paid Time Off Disability Insurance Affordable, Comprehensive Healthcare
Community Supports	Safe and Clean Environment Family Access to Healthcare and Well-Being Resources
Changing Workforce Demographics	Aging Workforce and Older Workers Vulnerable Worker Populations Workers with Disabilities
Policy Issues	Family and Medical Leave Bullying, Violence, Harassment, and Discrimination
New Employment Patterns	Contracting and Subcontracting Precarious and Contingent Employment Telecommuting Multi-Employer Worksites Financial and Job Security

Attention to advancing TWH in the face of emergencies and disasters is particularly relevant in the "Organization of Work" category where the impact of understaffing, rotating shifts, overtime, and long work hours during and post-disaster should be considered. Food, lodging, child or eldercare, and transportation may need to be provided to essential personnel. Demonstration of Employer Preparedness is an example of a TWH "Leadership" issue. For example, employers can provide clarity and reassurance regarding operational continuity or access to worksites to retrieve personal belongings. Employers can recognize that employees will have work-life balance challenges and assist them in meeting them without excessive conflict. Employers can anticipate that some of their employees may participate in civic preparedness and response activities that keep them out of work and can recognize their contributions to the community. Employers' inclusion of employees in on-going cycles of preparedness planning is also a relevant TWH leadership strategy.

There are many significant "Compensation and Benefits" issues related to human resources management post-disaster. Most importantly, employees will want to know that if their place of employment is closed due to a disaster, they will continue to receive pay and benefits for a designated time. Employees who will be required to work through disasters many need or deserve "hazard pay."

Work-life or health promotion programs could include training to help employees prepare their communities and families for emergencies and disasters. In the event of an emergency, impacted employees may need access to both physical and mental health resources and to be assured that their community is returning to safety. Employers may need to consider whether employees need to relocate until basic safe conditions are restored. These are cross-over elements from the TWH "Community Supports" domain.

In the "Changing Workforce Demographics" category, prepared employers will assure that all members of the workforce, included disabled and older employees, are able to cope and escape, if necessary. Workers with chronic health conditions may need medical surveillance if their work exposes them to excess heat (Coco et al., 2016). Vulnerable worker populations may be more impacted than others during disasters. For instance, if employees have family members without documented immigration status, they may be hesitant to access emergency services such as the Red Cross (Fussell et al., 2018). Employers may need to step in in response. There are also several TWH "Policy Issues" that have Employer Preparedness dimensions. Employees who have experienced injuries or illnesses either at work or from exposures in their communities will need accommodations and effective return to work programs. Leave policies may need to be put in place to assure that impacted employees can attend to their and their family's health and personal needs that disasters have made urgent.

Disasters may accelerate "New Employment Patterns." Employers may need to expand or shrink their workforce in response to emergencies and these policies may need to assure that responsibility for employee well-being is maintained for regular and contingent workers. While we are well-aware of the negative workforce impacts of the COVID-19 epidemic, where entire sectors of workers faced unemployment, crises can also lead to new business and employment patterns. Many recent weather-related disasters lead to an increase in recovery-oriented small business and labor contracting opportunities (Ochsner et al., 2018). However, these individuals and companies may not be well-prepared to protect themselves or their employees in the face of new hazardous environments. Owners of facilities and public agencies responding to crises such as wildland fires, will need to assure that contractors and recruits are adequately trained and protected to be able to work safely (Koopmans et al., 2020). These cross-over issues are examples of how TWH and Employer Preparedness intersect with community emergency preparedness and response.

Hierarchy of Controls Applied to Total Worker Health Employer Preparedness

Another useful conceptual model presented by NIOSH is the TWH Hierarchy of Controls. In the worker protection model of the Hierarchy of Controls, elimination of hazards at the source is prioritized over "downstream" approaches such as training. The inverted triangle emphasizes that deeper prevention is more reliable than strategies that depend exclusively upon either PPE or workers adapting their behaviors to avoid hazards according to instructions. In the TWH Hierarchy, (Figure 1a) new elements are added to the worker protection framework to include upstream organizational interventions to alter the work-environment to promote health through policies, practices, physical design of the work that eliminates threats to health and facilitates workers achieving a higher state of well-being.
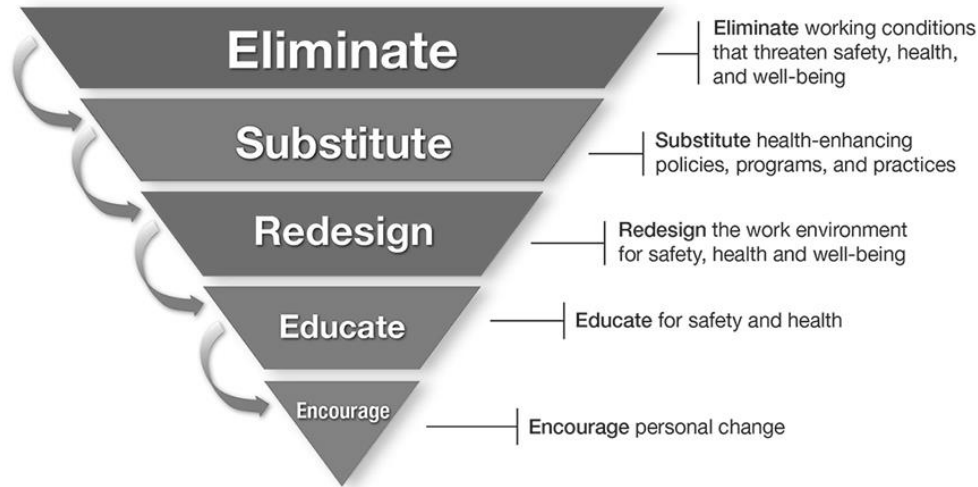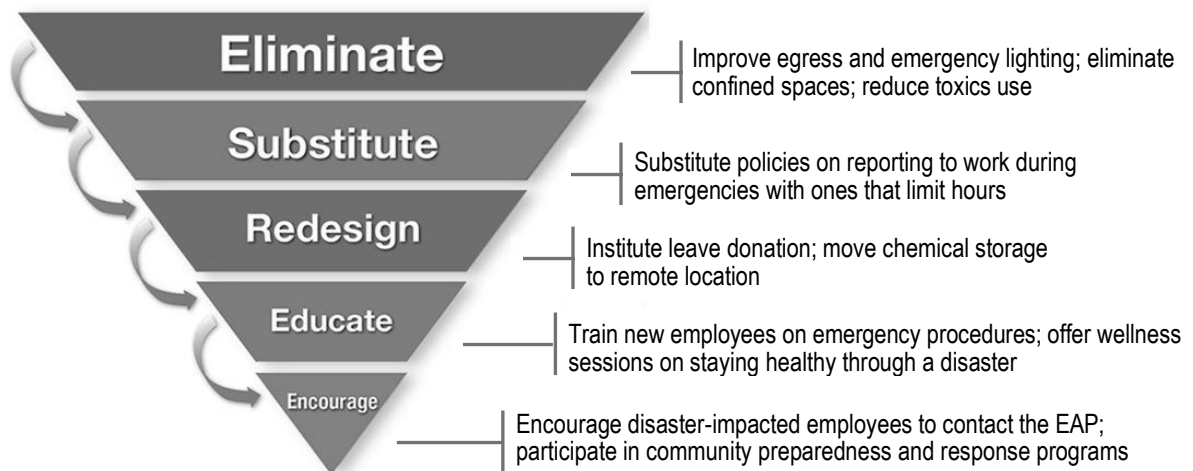
Figure 1a: Hierarchy of Controls Applied to TWH

Eliminate — Eliminate working conditions that threaten safety, health, and well-being

Substitute — Substitute health-enhancing policies, programs, and practices

Redesign — Redesign the work environment for safety, health and well-being

Educate — Educate for safety and health

Encourage — Encourage personal change

Figure 1b: Examples of Hierarchy of Controls Applied to TWH and Employer Preparedness

Eliminate — Improve egress and emergency lighting; eliminate confined spaces; reduce toxics use

Substitute — Substitute policies on reporting to work during emergencies with ones that limit hours

Redesign — Institute leave donation; move chemical storage to remote location

Educate — Train new employees on emergency procedures; offer wellness sessions on staying healthy through a disaster

Encourage — Encourage disaster-impacted employees to contact the EAP; participate in community preparedness and response programs

Figure 1b provides specific examples of Employer Preparedness interventions at each level of the Hierarchy. To eliminate hazards, employers can undertake toxics use reduction[1], improve to building safety and security, and renovate equipment. "Redesign" actions include safety engineering in anticipation of disaster impacts and transportation assistance to improve the safety of employees traveling to work in dangerous conditions. Training and Personal Protection are further down the TWH Employer Preparedness Hierarchy, but no less essential. It is the totality of these actions that contributes to comprehensive worker protection and wellbeing. However, the emphasis on upstream

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[1] For relevance see the Massachusetts Office of Technical Assistance video regarding Chemical Safety and Climate Change Resilience: https://www.youtube.com/watch?v=JrDfIDFi5AE

and engineered preparedness promotes greater investment in comprehensive and dependable strategies.

Total Worker Health Employer Preparedness Model and Assessment Strategy

Figure 2: Domains of the TWH Employer Preparedness Model
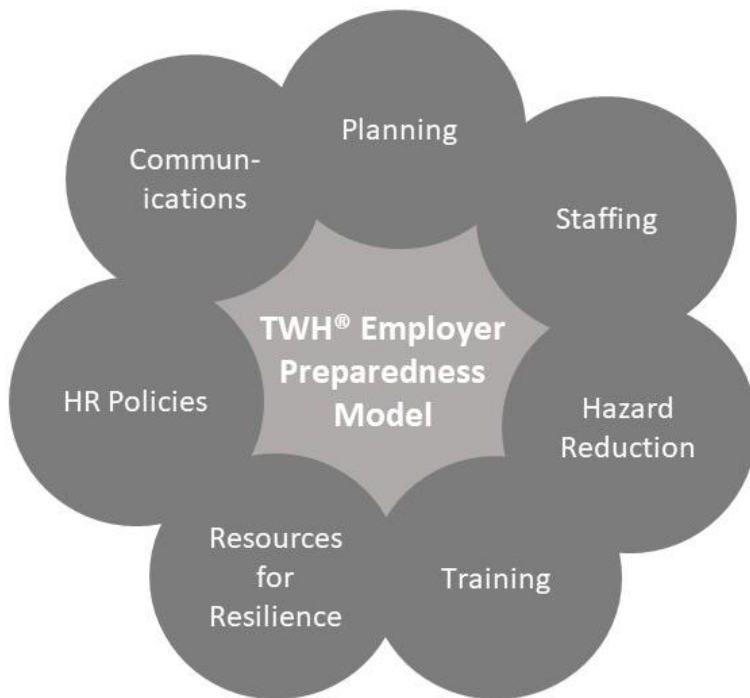
The preceding discussion suggests a comprehensive and complex vision of Total Worker Health Employer Preparedness. However, Employer Preparedness can be advanced with a practical and flexible model that assists employers in getting started. The proposed model suggests seven domains of Employer Preparedness and gives examples of elements of those domains. Figure 2 presents my proposition for seven critical domains for preparedness policies and planning actions. Examples of action steps for each of these domains is listed in Figure 3 and some sample policies are listed in Table 2. In keeping with the Hierarchy of Controls and a prevention-orientation, the model includes both hazard reduction in anticipation of emergencies as well as plans for emergency response and functional restoration. It is comprehensive of worker well-being including physical, social, economic, and psychological well-being. In brief, the domains and elements are described below:
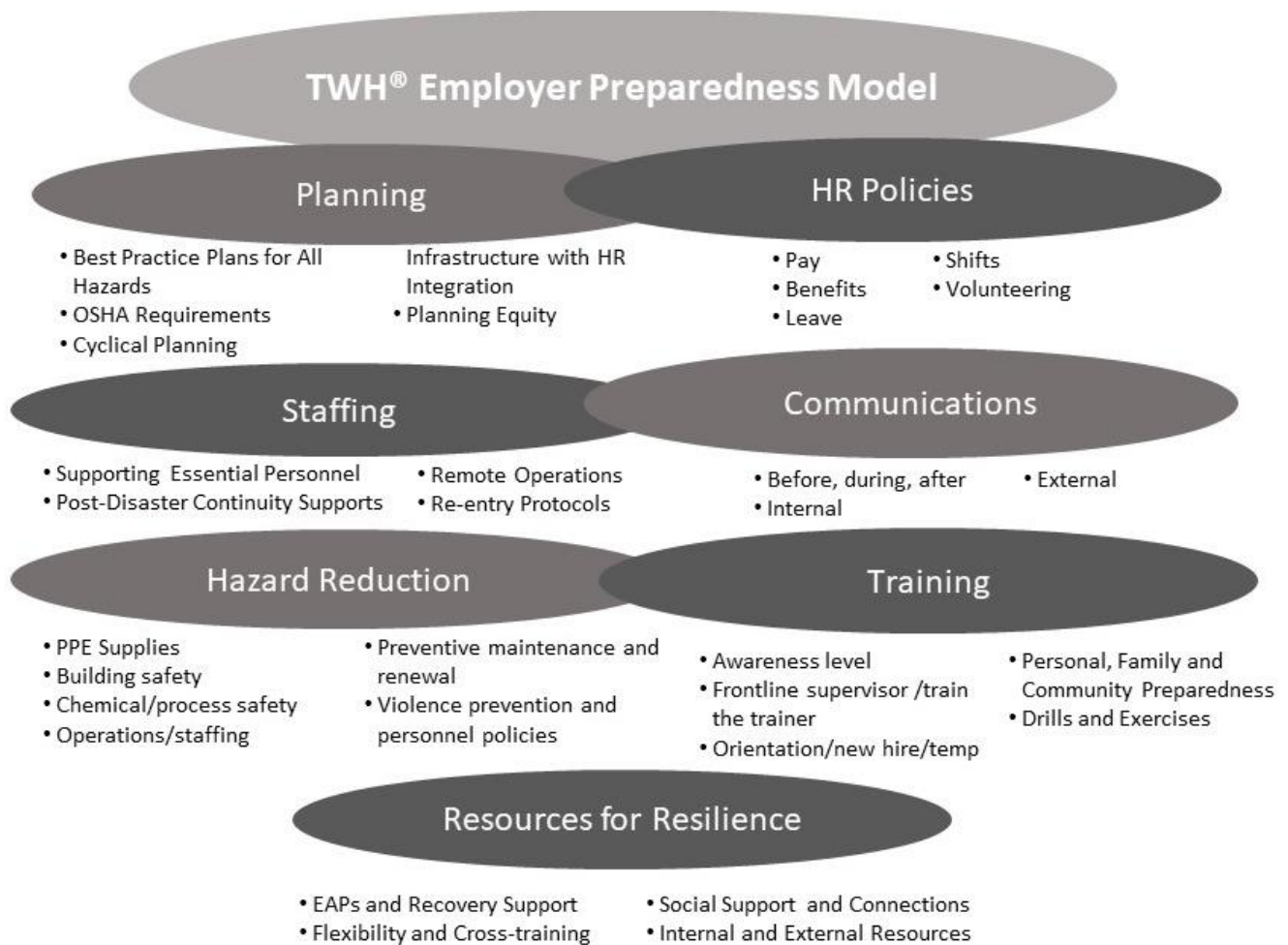
Figure 3: Domains and Examples

<u>Planning</u>

Devoting staff time and other resources to an ongoing Employer Preparedness planning processes is, perhaps, the most essential of employer actions. It is an expression of management commitment to Employer Preparedness and a commitment to employee participation in preparedness planning. A temporary task force might establish the basis of Employer Preparedness, however the dynamics of Employer Preparedness require an ongoing and iterative process that constantly improves with feedback from experience with events and drills. Models for planning include the Centers for Disease Control and Prevention's Building Resilience Against Climate Effects (BRACE) process which can guide entities through an assessment of potential threats and a cyclical process of addressing them (Marinucci et al., 2014). This process can be used for all hazards.

Table 2: Sample of Potential TWH Employer Preparedness Policies

Domain	Component	Sample Policy
Planning	Cyclical Planning with HR Integration	"HR staff shall be invited to participate on a quarterly basis in the Emergency Preparedness Planning Committee monthly meetings."
HR Policies	Work Shifts	"Employees shall not work more than 12 hours consecutively and shall have 24 hours off when they reach 65 hours."
Staffing	Supporting Essential Personnel	"Catering services shall be engaged to provide regular hot meals for essential personnel during emergencies."
Communications	Internal Communications (within company/agency)	"Redundant communications modalities shall be established to assure timely, reliable, and accurate communications with employees regarding emergencies."
Hazard Reduction	Chemical/Process Safety	"Back up power systems shall be installed and regularly maintained to insure ventilation to chemical storage areas in the event of power failure."
Training	Drills and Exercises	"Emergency response exercises shall be conducted with the Company Emergency Response Team and regional emergency responders on a periodic basis and when conditions change to necessitate new training."
Resources for Resilience	EAPs and Recovery Support	"Contracted EAP services shall include professionals trained in disaster response mental health treatment."

If it is not possible to establish a committee exclusively for developing TWH Employer Preparedness, a health and safety, health promotion or other committee could include TWH Employer Preparedness in their regular agendas. Additionally, many employers have initiated some emergency planning, but these processes may not include HR representatives, nor the comprehensive concerns of worker well-being. Thus, the Planning domain includes **Cyclical Planning Infrastructure with HR Integration** as an essential element. It is the basis of all other domains and elements.

To conduct their work effectively, committee members may need training, as many of the subjects of Employer Preparedness are new. This committee can then take up an agenda that includes developing **Best Practice Plans for All Hazards** guided by industry standards, recommendations from the Red Cross, National Safety Council, or government agencies such as Federal Emergency Management Administration; assessing, meeting and exceeding relevant **OSHA Requirements** such as means of egress and preventive maintenance schedules; and paying particular attention to **Planning Equity** that focuses on the needs of employees who are disabled, older, temporary/contract, and others who may need special attention, such as employees with limited English-language skills.

Human Resources Policies

The HR Policies domain includes policies related to **Pay** and **Benefits** during and following emergencies and disasters that may shut down the employer or may compromise operations. These pay and benefits policies should consider situations where employees are unable to report to work, either due to direct impacts, or because they followed evacuation orders. Additional "hazard/disaster pay" for employees who work as essential personnel when other personnel have been dismissed or evacuated may be necessary. Manageable **Shifts** and designated work-rest periods for personnel working during or following disasters when the employer maybe short-staffed are essential for sustaining employees through these events and preventing accidents and other ill-effects from exhaustion. Committees will need to consider these issues under a range of potential scenarios.

The committee should consider disaster-related **Leave** policies. These could include the establishment of leave banks for employees who may not be able to report to work. A leave bank allows employees to "donate" unused personal days to a leave bank that can be access by employees who need to attend to disaster-related matters such as destruction of their homes or personal property or to family members who are impacted by a disaster, even in another part of the country or world. Some staff may be called upon as emergency **Volunteers,** including as rescue workers, during and following a disaster. These volunteers may be unable to report to work because they are occupied with community response. Policies might include recognizing and paying these employees for their community service and sponsoring volunteer, fundraising, and support activities that help the employers' communities recuperate.

Staffing

The Staffing domain overlaps with HR policies but focuses particularly on the who, what, when, and where of employment through emergencies and disasters. Business continuity planning is a core component of emergency planning; the Staffing domain focuses continuity planning on the wellbeing of employees. Thus, the element of **Supporting Essential Personnel** refers to the special needs of those working when others are not and includes planning for meals, transportation, housing, child/elder care, and emotional support for these individuals. **Post-Disaster Continuity Supports** refers to arrangements for telecommuting, transportation, flexible schedules, and temporary staffing. If a disaster means that the employer must establish **Remote Operations,** the needs of personnel who are relocated will be considered. Finally, following a disaster that impacts an employer's operations, employees will be

anxious to know about retrieving personal belongings or equipment necessary for remote work, or gaining access to the facilities, generally. The answers to these questions should be guided by **Re-entry Protocols** that assure employee safety.

Communications

Communications refers to both **External** and **Internal** communications and span the timeframes of **before, during and following** an emergency or disaster. External communications will be with federal, state and local emergency response and regulatory agencies, and the media. Such communication is often mandated in emergency action plans and standards. For example, employers with hazardous chemicals must establish advance communications with fire departments and Hazardous Material response teams. Internal communications will include risk communication, training opportunities, employer policies and protocols, take-home materials, and alert systems. Many employers have established mobile phone alert systems, but building alarms are also necessary as well as employee training about how to react to the alarm. Finally, post-disaster, employers will need to establish communication portals that share information with employees who may be without power or who may have left the area.

Training

Training is a core component of Employer Preparedness and includes many levels including **Awareness level** for all employees for all hazards, **Frontline supervisor training, Training for Trainers** of other employees or Employer Preparedness committee members; and training aimed at new employees during **Orientation** or for Temporary employees. "Sit-down" training needs to be complemented by **Drills and Exercises** that facilitate learning from simulated disaster scenarios. These drills generally integrate involvement of community emergency responders. Employee well-being will also be supported by programs aimed at promoting **Personal, Family and Community Preparedness** and raise the profile of the employers' preparedness in their host communities.

Hazard Reduction

Committees should prioritize the identification of opportunities to prevent or minimize disasters. This would include attention to **Building safety**; toxics use reduction and **Chemical Process Safety** to minimize hazardous materials; and **Preventive maintenance and renewal** of vulnerable equipment. Adequate **Staffing** plans are necessary to assure that critical **Operations** can proceed during emergencies and disaster response. **Violence prevention and personnel policies** should be revisited and security equipment and protocols put in place. While not hazard reduction, the risks of serious impacts maybe reduced if the employer assures that adequate emergency supplies and **PPE** are on hand or available in supply chains and in good shape for potential emergencies.

Resources for Resilience

Resilience means the ability to get through, bounce back from, and integrate lessons from serious disruptive events into preparedness planning. Factors that contribute to resilience include inter-personal connection, flexibility, and adequate supports that acknowledge the full impacts of disruptive events. Employers can help develop a resilient workplace by providing access to **Employee Assistance Programs** and other **Recovery Support** services such as social work, advocacy, and mental health that are keyed into the needs of employees impacted by disasters. Employers can anticipate that a workforce that is **Flexible and Cross-trained** to do a variety of tasks and in different sectors of operations will support continuity through challenges and help employees feel less helpless. Studies of disasters suggest that **Social Support and Connections** are critical to help people survive disasters. Employers can promote

these connections through various programs and activities. Employer sponsorship of **Internal resources** such as on-site recovery assistance with basic necessities and assistance with filing insurance claims, as well as links to **External Resources** such as the American Red Cross and disaster assistance programs are also critical.

This model is not prescriptive. Rather, it suggests processes and policy areas for employers to utilize in tailoring preparedness to their workplaces. For example, the "Planning" domain does not dictate which hazards should be the subject of employers' preparedness planning, but instead suggests that they establish a diverse committee, including HR and front-line staff, that engages in cyclical planning processes. Under HR Policies, the model suggests that employers establish disaster and emergency-related pay policies but does not specify what they should be. Indeed, in unionized workplaces some of these issues will be subject to collective bargaining agreements. A much lengthier list of planning areas could be included, but this model trusts that dedicated committees can determine critical preparation through their planning processes.

Conclusion

From this condensed model, employers can build an assessment strategy that surveys the status of these Total Worker Health Employer Preparedness domains and advances their preparedness. A companion article describes a survey of HR personnel that included one or more questions in each of the seven domains. It also proposes an Employer Preparedness Index to gauge the level of perceived preparedness among human resources professionals in the Northeast. An employer-based self-assessment based on the Total Worker Health Employer Preparedness Model could include more elements and rate responses to suggest improvement in the domains deemed most important by the employer. The model, survey and index can also be used in a public health and general emergency preparedness context to inform emergency management agencies about preparedness gaps and strengths in their communities.

In the face of many pressing "regular" demands, employers may need motivation and assistance to advance their capabilities for protecting their employees and promoting their well-being through potential emergencies and disasters. The Total Worker Health Employer Preparedness model is broadly comprehensive, while allowing for flexible adaptation through a systematic process that results in a relevant set of policies and plans that improve with experience. This process draws upon the characteristics, preferences, and resources of the employer and workforce to create an appropriate baseline strategy to protect employee well-being through emergencies and disasters.

CONFLICTS OF INTEREST: The author reports no conflicts of interest.

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