



# Stressful Effects of Disasters on Workers

## About the Print Version

This print version of the module includes all the substantive content from each screen, except for the Check Your Understanding exercises and the final quiz. The workbook, which is referenced throughout the module, is available online.

## Introduction to Workforce Resiliency

It comes as a surprise to many people that resilience is the most common response observed in disaster survivors. In general, humans have a remarkable ability to cope with adversity, trauma, loss, and tragedy.

This module is one of three modules in which we will explore how individuals and organizations can use this natural human tendency towards resiliency to improve their functioning in daily life as well as during a disaster. In this module, we will:

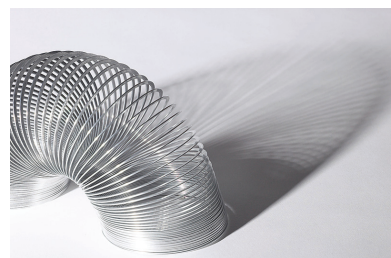
- Define stress and its relationship to workplace resilience.
- Talk about everyday, routine work stressors and disaster-related stressors.
- Review how humans tend to respond to chronic and acute stress on physical, mental, and psychological levels.
- Help you begin to understand individual and workforce resilience as well as your own response to stress.

Once we have explored the types of stress and how stress affects individuals, we will connect the concept of individual stressors to individual and workforce resilience. The two modules that complete the workforce resilience training focus on the steps that organizations and individuals can take to build resilience (personal and workforce) before, during, and after a disaster occurs.

## Resilience Defined

Individual resilience refers to the ability of individuals to continue to function both physically and psychologically despite adversity, trauma, loss, or tragedy. Remember, almost everyone demonstrates resilience to some degree, as it is the most commonly observed human response to disaster.

However, just because individuals demonstrate resiliency doesn't mean that they don't have a wide range of feelings about and responses to their experiences. Emotional distress is often part of the resiliency process. You will learn more about normal and problematic responses to stress later in this module.



## Continuity of Operations

While organizations can be affected by stressors such as budget cuts as well, resilience in the workforce differs from personal resilience because it requires both the individual employees (or at least a significant number of employees) and the organization to continue to function. Workforce resiliency is based on the assumption that an organization's mission must continue in the face of and despite a disaster. When an organization is able to continue to function and support its mission during an emergency, the organization is demonstrating **continuity of operations (COOP)**. For instance, how continuous will operations be if 30% of an organization's workforce is out sick due to an influenza pandemic? Can the organization still continue to provide critical services?

Turn to Exercise 1 in the Workbook to list stressors that can affect your organization and to consider how those stressors affect your individual stress level.

### Business Continuity Exercise

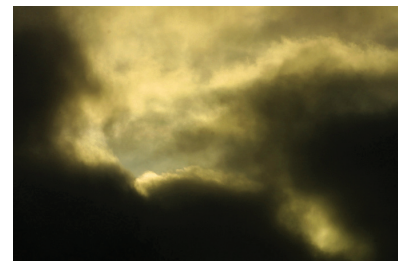
An organization is just beginning to create a business continuity plan that will help them determine what steps they will need to take to demonstrate continuity of operations during a disaster. What types of information does the organization's management need to know before creating such a plan? Type your answer in the textbox below. After you have finished, please select "Sample Answer" to see one possible response.

*One possible plan requires a company or organization to identify its critical services or functions. Then, the next COOP step would be to identify those in the company or organization who provide those services or functions normally and to cross train additional employees to fill-in in the event of widespread absenteeism. Another useful step in the COOP process would be to identify the needs and opportunities for homebound employees to continue working— for example, by telecommuting.*

## Stress Defined

Stress is the experience of perceiving that the demands of a situation tax or exceed our ability to cope with those demands. The demands of the situation may present themselves as a challenge, change, threat, or a stressor. Stress is experienced both physically and emotionally.

An individual's level of stress before, during, and after a stressful event affects an individual's resiliency. For example, how well do you think you are able to cope with a significant change at work if you are already exhausted from stress at home?



Turn to Exercise 2 in the Workbook to explore your personal, job-related stressors.

## Good News and Bad News about Stress

There is good news and bad news about stress. First, the bad news: reality is what causes people the most stress. Now, the good news: most people are not in touch with reality. Although this may seem like a humorous exaggeration, it turns out that a little distortion of reality is probably a good thing. Research has shown that some level of unrealistic optimism or “helpful illusion” often helps us cope with our stressors.

## Stress Perception Is Important

If stress is the experience that occurs when we perceive that the demands of a situation tax or exceed our ability to cope with those demands, it makes sense that our thoughts about a stressful situation are important. In fact, our reactions to stress depend, in large measure, on our thoughts and perceptions about the situation and our capacity to cope.

Research has shown that thoughts can intensify or limit the experience of stress, affecting our emotions and our bodies.

## Experiencing the Effects of Perception

Take a moment to listen to the following audio clip which helps demonstrate the mind/body connection.

*Transcript: This exercise is designed to show the connection between mind and body. It is called the “Perfect Lemon” exercise.*

*If you could, please sit back, relax, and close your eyes. Now imagine a perfect lemon. In your mind’s eye, look at the texture of the peel. Hold the lemon up to your nose and scratch the surface with your fingernail. Smell the lemon-y scent.*

*Next, take an extremely sharp knife and use it to cut the perfect lemon exactly in half. Now, take one half of the perfect lemon and bring it, fruit side up, to your nose and smell it once again.*

*Now squeeze the perfect lemon and then take a big bite out of your perfect lemon. Now at this point, what do you notice? Most people at this point are salivating.*

Are you salivating at the mere thought of this perfect lemon? Consider your physical reaction to this visualization exercise. Most people do salivate when they imagine a perfect lemon, making this exercise one example of how our thoughts can affect our physiology.

## Occurrence of Stress

Stress is a normal part of everyday life at work, at home, and everywhere in between. Smaller amounts of stress are preventable or manageable and some

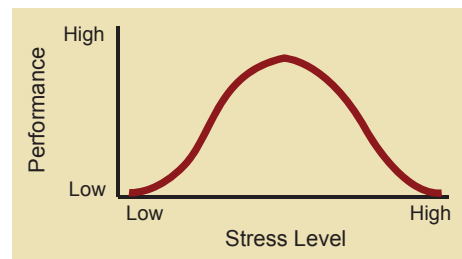
degree of stress is actually productive, resulting in enhanced levels of performance. However, many day-to-day stressors are repetitive and can accumulate over time, with higher levels of stress impairing performance.

This section outlines the effects of stress, both positive and negative, on performance.

### Stress and Performance

The Yerkes-Dodson Law was named for the primate center where it was first described almost a century ago. This “law” was derived from experiments in which scientists would pose certain problems for nonhuman primates and then manipulate the animals’ stress level.

What they found was that a certain level of stress was actually helpful in terms of the primates’ performance. In fact, there was an optimal level of stress that was associated with the best performance. As the level of stress increased past this ideal point, primate performance decreased. The same basic relationship documented between stress level and performance has been replicated in human primates: us.



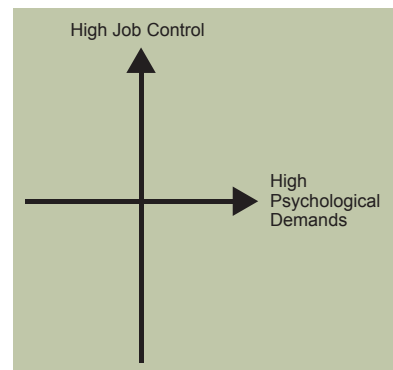
Yerkes-Dodson Law

This discovery supports the position that stress management should not consist of trying to eliminate stress, which would be impossible anyhow. Instead, a more realistic and appropriate goal is to manage high levels of stress in ways that reduce the stress and its effects. In managing stress, we can edge our performance towards the optimal range.

### Occupational Stress and Strain

Karasek’s Model of Occupational Stress and Strain (at right) is one of the most influential contemporary models of how characteristics of an occupation relate to stress and strain on the worker.

One dimension of this model varies in relation to a worker’s amount of job control or decision latitude. At the lower end of this job control dimension are occupations that have very little control over their duties. These include positions such as freight handlers, construction workers, and assemble line workers who have very little control over their duties and often lack the opportunity to be creative in the context of their jobs. Those depicted at the top are jobs or occupations in which workers have a great deal of latitude or control. For example, architects, public officials, and natural scientists have a fair amount of control and can bring creativity to their daily work.



Karasek’s Model of Occupational Stress and Strain

The other dimension of this model is psychological demand. Psychological demands are what people usually think of when they

think of job stress, the mentally challenging and draining demands of a job. At the low end of the scale are occupations that generally don't have high levels of psychological demand, such as a house painter or janitor. At the high end of the scale are occupations that have more psychological demands such those of a firefighter or waitperson in a restaurant.

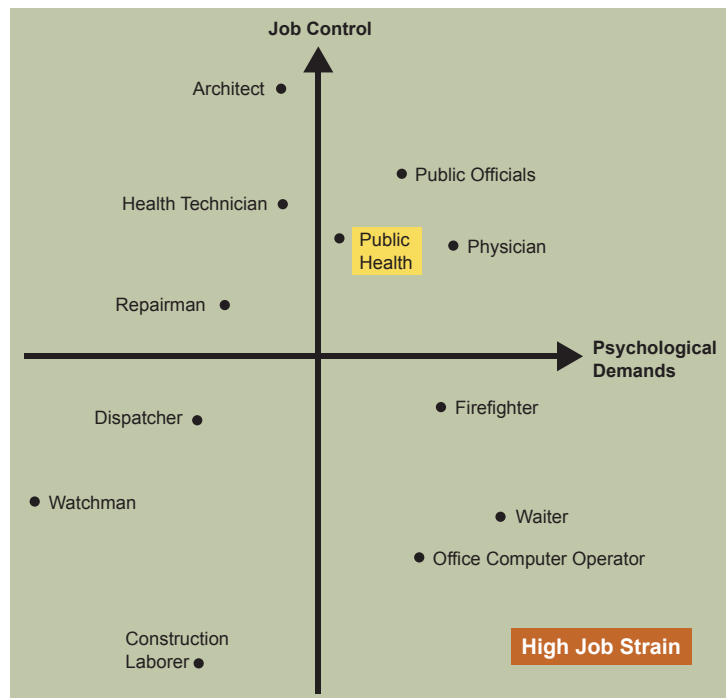
## Occupational Stress and Strain Examples

When the two dimensions of decision latitude and psychological demands are mapped on the same graph, a point can be plotted on the resulting grid that characterizes an occupation in terms of the demand/control relationship. For example, firefighters have above average psychological demands and below average levels of job control. Firefighters rely primarily on teamwork, so they don't have a great deal of decision latitude or room for creativity in many settings. And the psychological demands of time urgency and life-and-death responsibilities are quite high for firefighters.

Occupations that have high psychological demands and low job control, such as firefighting, fall in what is termed the "high job strain" quadrant. High job strain occupations have been shown to be the most toxic of those in any of the four quadrants and so are associated with higher levels of distress and stress-related disorders such as cardiovascular and gastrointestinal problems, depression, and other physical and mental health disorders..

## Disasters Are Different

Disasters are different from routine stressors and even from most emergencies because of their scope, and also because the community in which the public health worker lives and serves is affected. A surge of patients who will need medical attention may tax the healthcare system during and in the immediate aftermath of a disaster. Public health workers may need to triage patients and prioritize services. There may be mass casualties and fatalities, and communications systems may become overloaded and fail. And finally, the disaster responder's own home, family, and workplace may be affected by the disaster. In this case, the disaster responder becomes a co-victim.

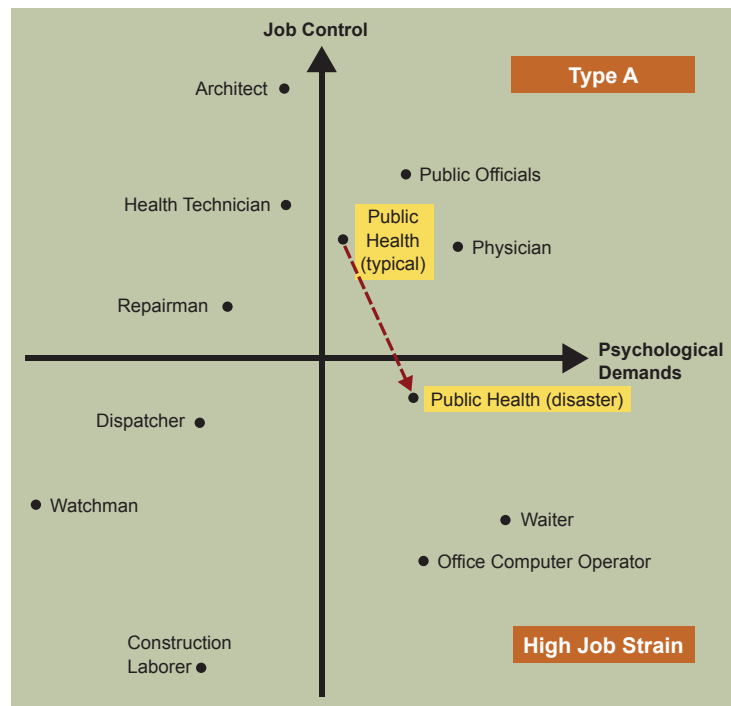


See Example 1 in the Workbook for Samples of Organizational Stressors in Public Health.

An example of co-victimhood is the trauma that members of the New Orleans Police Department and City of New Orleans Public Health Department experienced after Hurricane Katrina. With the destruction of their homes and the danger to themselves and their families, stress caused more than 200 officers (of the 1,700 on the streets before the hurricane) to desert during the storm, with others retiring or simply leaving New Orleans. According to one report to the US Department of Defense, at one point the New Orleans Police Department was down to less than a third (fewer than 500) of the officers who had been available for duty.

## Public Health Stress and Strain

Under normal circumstances, a public health worker's job description would probably place them in the quadrant with high decision latitude and high psychological demands. We'll call this the "Type A" quadrant. (The Type A quadrant name is derived from the Type A personality type: hard-driving, achievement-oriented, and "time-urgent.") Workers whose occupations fall in this quadrant face significant psychological demands. But these occupations are not usually as toxic or harmful to worker health as those in the high job strain quadrant, partly because the Type A quadrant workers have more job control and decision latitude.



If we incorporate a disaster into Karasek's model, the public health worker's point on the grid migrates. Because disasters increase the psychological demands and also reduce the degree of control, public health workers, in theory at least, would move from the Type A quadrant to the high job strain quadrant. Fortunately, most disasters are time-limited, but the potentially harmful effects of a combination of high demands and low control during a disaster need to be considered. Both organizations and individuals need to recognize that, even if temporary, the high job strain may take a toll on those responding to a disaster and needs to be incorporated into disaster planning.

See Example 2 in the Workbook to explore lessons learned and stressors associated with public health workers in disaster situations.



## Disaster Phases

Disasters generally can be divided into three phases: pre-event, event, and post-event. Each phase typically has its own stressors. The type of disaster also affects the types of stressors associated with a particular event.

### Pre-event

The pre-event phase is the time period in which the disaster is anticipated, warnings are given, and preparations can be made. Some disasters such as an unexpected road collapse or earthquake don't have a defined pre-event phase. However, some events can be predicted and the public can be warned.

Although it is better to be forewarned, this knowledge can produce its own stressors. For instance, if a weather-related event is expected, people may stock up on disaster supplies such as food, plywood, and plastic, so that needed supplies run short. People may converge on gas stations to buy fuel in anticipation of a possible evacuation. Terrorist attacks can also sometimes be anticipated, which, when publicly announced, can disrupt normal activities as everyone tries to exercise caution.

There may also be sensational media coverage preceding the event, some of which may be incorrect. In other cases, the media may not give needed coverage to an important aspect of an event. For example, the media may publicize an impending storm which will likely cause power failures but they may fail to educate the public about the potential for carbon monoxide poisoning due to community residents relying on generators for power or unsafe combustibles for heat.



### Disaster Phases: During a Disaster

The next and most destructive phase of a disaster is the event phase, which occurs during a disaster. Stress in this phase may come from the number of injuries and fatalities, as well as the destruction of infrastructure (e.g., roads, communications, hospital systems, and transportation). People may be separated from their families and loved ones. Survivors may suffer acute psychological trauma symptoms and may be exposed to secondary hazards.

For example, in the case of Hurricane Katrina, the damage to the oil facilities by the hurricane caused the release of hazardous materials into the environment. Another significant stressor for many survivors during Hurricane Katrina was the fact that many shelters would not allow pets to accompany the survivors.



## Disaster Phases: Post-Event

Stressors continue after the disaster event is over. Immediate post-event communication is often problematic or impossible, which can compound anxiety and worries if survivors are separated from loved ones. Other potential post-disaster stressors include serious injury or death of family and friends, loss of housing and property, hardships such as lack of basic necessities (shelter, heat, food), and downstream effects such as job disruptions or damage to the community infrastructure.

## Dimensions of Stress

The human stress response has several different dimensions. As you can see from the model shown below, developed by Dr. James Schultz and the Disaster Epidemiology Emergency Preparedness (DEEP) Center, there are six different ways that stress manifests itself. Each of these dimensions (e.g. physical) includes specific symptoms and can affect individual resiliency differently.

Physical	Body reactions
Emotional	Feelings
Cognitive	Thinking and decision-making
Behavioral	Actions
Spiritual	Beliefs and values
Social	Interactions

## Physical Dimensions of Stress

The first domain in the DEEP Center model deals with the physical effects of sudden, acute stress. To demonstrate how this kind of stress affects every organ system in the body, we're going to create a fictional individual, Susan.

Let's say Susan is crossing the street when she notices that a car is speeding directly toward her. What happens in her body as she realizes that she is in imminent danger? First, her body releases stress hormones including adrenaline and cortisol. The hormones trigger a cascade of reactions in her body. Her blood pressure increases, her heart beats faster, and the blood vessels near the surface of her skin constrict to limit blood loss if an injury occurs. Susan's digestive system slows down to send the blood back to organs that are more important for short-term survival like the brain and muscles.

All of these responses together are called the "fight or flight" response. This response evolved to protect animals in life or death circumstances and it influences activity in every human system including the nervous system, behavior, communication, judgement, perception, and memory. In this case, her body uses the fight or flight response to give her a burst of strength that allows her to jump back onto the sidewalk and avoid danger.

After the danger has passed, Susan's body will return to normal functioning. Sometimes, however, the fight or flight response is triggered by something that is not actually physically dangerous, such as a confrontation at work or heavy



traffic. If this happens chronically, health problems can result because the body is forced to stay in the heightened state. Potential problems that can develop in response to chronic stress include immunosuppression, heart disease, organ damage, injuries to the back and shoulders, and others.

Similarly, chronic fight or flight reactions can be elicited in response to something that is actually dangerous such as repeated battlefield experience. This affects health as well and can lead to Post-Traumatic Stress Disorder (PTSD). PTSD presents physical symptoms of persisting acute stress responses including panic attacks, insomnia, and nightmares. .

## Emotional Dimensions of Stress

The second domain in the DEEP Center model deals with the emotional effects of stress.

Let's put Susan in another threatening situation. Let's say she has been a witness to a large-scale disaster like a hurricane. What are the emotional effects of such an experience?

Among the many emotional reactions we might expect, Susan may experience emotional numbing, i.e., becoming so overwhelmed that she shuts down emotionally. She also may experience anxiety, tearfulness, irritability, hopelessness, helplessness, fear, terror, and anger. These reactions do not necessarily mean that Susan is not displaying resiliency. Emotional distress is to be expected in most disaster survivors. Resiliency is a matter both of degree of severity of symptoms and stressors and whether symptoms become chronic.



## Cognitive Dimensions of Stress

Among the other effects Susan can expect as a result of experiencing acute stress is a change in thinking, or *cognition*. For a short time, stress hormones can increase speed of processing and create a heightened focus. Over longer periods of time, however, people are likely to become overwhelmed and shut down. Susan may experience a shorter attention span, decreased concentration, reduced ability to calculate, and difficulty with making decisions. She may be confused and experience memory problems. She may also not initially believe that the disaster is occurring or has occurred, which is a common reaction. Disasters often take place so quickly that the mind struggles to interpret what has happened. Later, after the disaster, Susan may find that she has difficulty believing things will get better, and she may have a tendency to see only the worst. These are other common cognitive reactions to disasters and are not necessarily signs of a lack of resiliency.

## Behavioral Dimensions of Stress

The aftermath of a disaster can cause behavioral changes. Susan and her fellow victims may experience changes in sleep patterns including an inability to sleep, along with changes in appetite (which may affect the healthfulness of their diets), frequent crying, and sometimes, inappropriate humor. (Appropriate humor is a positive coping mechanism.)

Victims of a disaster may turn to drugs or alcohol to cope. Researchers have examined alcohol use by emergency workers following disasters and emergencies and have found considerable evidence that increased use of alcohol can be a long-term legacy of disaster.

Finally, many disaster survivors find that they lose interest in activities they previously enjoyed and that such activities do not seem worth doing. As some victims report, “life tastes like cardboard.”



## Spiritual Dimensions of Stress

The fifth domain in the DEEP Center model deals with the spiritual effects of stress.

Frequently, disaster survivors find their spiritual beliefs challenged. Susan may find herself questioning her values and beliefs, feeling like she has lost her sense of meaning, and expressing anger towards her god. Long-term, spiritual changes could include a feeling of cynicism or loss of previously held religious or spiritual beliefs.

However, it should be noted, many people actually feel their spiritual beliefs are strengthened in the aftermath of a disaster or other major trauma.

## Social Dimensions of Stress

In the social arena, one of the most common effects of stress is withdrawal. Prolonged withdrawal and avoidance of social interactions are reliable predictors of long term post-traumatic stress reactions. On the other hand, some people may have a greater need for comfort, to the point of demonstrating emotional dependency on others.

Sometimes survivors become hostile. They may exhibit aggression and find themselves involved in more interpersonal conflict than they otherwise would in less stressful circumstances. These social difficulties may subside as the effect of the stress diminishes and resiliency increases, or survivors may need professional help to return to normal social interactions.

## Assess Your Symptoms of Stress

You just learned about the six domains of stress in the DEEP Center Model. Do you recognize any of these stress symptoms in your own life? This exercise provides you an opportunity to measure your own stress. The exercise is in the Workbook.

## Summary

In this module, we have explored the definition of stress and how it can affect workplace resilience. You should now have a better understanding of the types of stressors that can affect individuals on a day-to-day basis, as well as the stressors associated with each phase of a disaster or emergency. In addition, you should now be able to describe the six dimensions of the human stress response and how those correspond to chronic and acute stress responses.

In upcoming modules, you will continue to learn about workforce resiliency. In the second module, the goal is to be able to list and describe preventive steps that organizations and individuals can take to build resilience, both personal and in the workplace, before a disaster occurs. In the final module, we will identify actions that both organizations and individuals can take to preserve workforce resilience and personal resilience when disaster strikes. We will also describe steps that organizations and individuals can take to retain and/or rebuild workforce and personal resilience after a disaster.

