Disaster Characteristics

Self-Study Guide, to be read prior to attending the Fundamentals of Disaster Mental Health training

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Disaster Characteristics

In July 2015, California State firefighters had responded to almost 4,000 fires. Drought, high winds and high temperatures created a much higher risk of wildfires throughout the West and Northwest. One family, faced with an order to evacuate their home as fires raged nearby, packed their belongings while watching helicopters and air tankers fight the fire. They agonized over what to pack and what to leave behind. The family had no doubt they would bring most of the pets, but the parents drew the line on the aquarium. The fish, they explained to the children, would have to fend for themselves. Everyone was quite stressed when they arrived at a shelter about thirty minutes away, to find out that the shifting winds now allowed them to return home. They were relieved but exhausted. When they got home they made calls to reassure relatives and got some rest. In the middle of the next night they were awakened by a police officer who informed them that a containment line had been breached and they would have to evacuate a second time. This time the family drowsily got into their van and headed back to the shelter with the expectation that this would be another brief stay. Although they loaded up the pets, they did not bring as much as a change of clothes. Tragically there was no home to return to. The fire destroyed the neighborhood along with all their belongings. The parents were distraught and grieved the loss of photographs they had not saved. They blamed the boy who started the fire by playing with matches. They blamed the authorities for denying climate change that contributed to the drought and higher temperatures. They blamed their bad luck having to evacuate at night, but most of all they blamed themselves for not taking their most precious belongings, being careless and believing the evacuation order would be just be another false alarm.

Consider the factors that made this disaster, like most, a unique event. Why would it be helpful for a mental health responder to have an understanding of the characteristics of this event before meeting with the family? As you read about characteristics in preparation for the training, think about how you could translate your understanding into providing more effective assistance.

This reading will focus on disasters themselves, in particular on key event characteristics that tend to impact survivors' reactions. These characteristics directly affect survivors in terms of the length and nature of trauma they experience, which we'll see are strong predictors of mental health reactions. In addition, these same characteristics often influence the logistical demands faced by emergency responders and community members before, during, and after disasters. Since the degree of success responders have in managing those demands impacts resulting conditions in the community, these characteristics also indirectly influence individuals' reactions by shaping the recovery environment.

Before we describe those characteristics, let's consider a basic question: What constitutes a disaster? There's no single universally accepted definition, and as we'll see, an event that's experienced as a disaster in one setting might be perceived as a routine emergency in another. The following general description can be broadly applied: "A disaster is a natural or human-caused catastrophe that causes destruction, frequently including loss of life, with permanent changes to an environment and a community" (Halpern & Tramontin, 2007). We'll return to issues of causality and loss later; for now let's focus on the final part of this definition.

The main factor that sets disasters apart from more individual types of traumatic events is that they occur at the **collective, community-wide level**. While an experience like a serious car accident or a sexual assault certainly feels disastrous to the person who goes through it, generally we can assume that his or her natural sources of support—friends, family members, and neighbors—have not been directly affected, so they're available to provide comfort and assistance to the survivor as he or she processes and recovers from the event. That is often not the case in disasters that impact an entire neighborhood or large group. If the neighbor who might offer shelter to a family displaced by an individual house fire has also lost their home to a wildfire, each family is left in need. Rather than helping each other out, both may need to rely on outside assistance in the form of, for example, an American Red Cross shelter where their specific requirements may not receive much attention amid the demands of housing and feeding all who have been impacted.

Compounding that collective impact, disasters often permanently reshape the communities where they occur. Infrastructure may be damaged or destroyed, leaving people unable to get around, without hospitals and healthcare services, schools and places of worship. This means that the recovery environment is disrupted and unfamiliar. The sense of community and stability most of us rely on is suddenly gone, and it may take considerable time to regain it. It's not uncommon to hear residents say things immediately after an event like "We'll rebuild and make it just the way it was before!" only to come to the painful realization that it will never be exactly the same again. Some community members may choose to move away rather than risk living through another weather event they now realize they're vulnerable to; some may not be able to afford to rebuild; some may have died. While ultimately the community should be able to achieve some type of "new normal" (which may in some ways be better than the original), getting there involves accepting and mourning the loss of the old way of life.

So, while you will be able to apply your training in treating individual forms of trauma to your work as a disaster mental health helper, keep in mind how disasters shape not only survivors' actual experience of the event, but also the context in which their recovery must occur, especially the constrained ability to rely on their usual sources of support.

Types and Frequencies of Events

Think about the wide range of disasters we hear about in the news and prepare for professionally—from seasonal events like hurricanes and ice storms, to mass transit accidents, to terrorist attacks. Here's a far from complete list of events that can and do occur within the United States and worldwide:

- Floods
- Volcanoes
- Mudslides
- Oil spills
- Toxic Spills
- Wildfires
- Transportation accidents (plane / bus / train)
- Bridge collapses
- Nightclub fires
- Mass shootings
- Terrorist attacks
- Bioterrorism
- Pandemics / public health emergencies
- Tornadoes
- Hurricanes
- Ice storms
- Blizzards
- Earthquakes
- Tsunamis
- Power outages/ blackouts
- Violent public disturbance / civil disorder

Unfortunately many of these events are increasing in frequency and intensity. Acts of organized terrorism and episodes of violence by so-called "lone wolves" are on the rise; an active shooter incident resulting in at least four people wounded or dead occurs more than once a day on average in the U.S., most commonly in the workplace and in schools. Climate change is causing more extreme weather events worldwide as well as increasing the spread of many diseases, and creating general anxiety about food insecurity and other future effects. At the same time that climate change is increasing the frequency and strength of many weather- and climate-related events, population increases worldwide result in more people living (sometimes by choice, but often due to economic necessity) in areas that are prone to regular natural disasters like wildfires or floods or tornadoes, so more people may be impacted when an event does occur than in previous times.

All of this means that the need for mental health services for disaster survivors has never been higher. Fortunately this growth in demand has been paralleled by both increasing recognition of the psychological toll disasters take and the development of more effective interventions for both short- and long-term reactions.

The Disaster Management Continuum

Regardless of the type of event, a basic rule of disaster management is that the response always begins at the local level and is scaled up as necessary to meet needs that exceed local capacity. Therefore, preparedness begins at the community level and emergency managers must plan for the best possible local response, in addition to understanding how to bring in more aid as needed. Of course, it would be impossible to predict and plan for every possible contingency, so plans often use an "all-hazards" approach that could be applied to any kind of disaster rather than focusing on narrowly defined events. Still, lessons can and should be learned from each response and used to improve plans for the next event. This cycle is referred to as the **disaster management continuum**, which can be broken down into five main phases. With our understanding of human behavior and some familiarity with research on psychological reactions to disasters, mental health professionals can contribute in important ways to each phase.

1. Planning and Preparedness

Potential hazards are identified and local response capacity and infrastructure are assessed. Plans are created to determine specific roles and responsibilities for those involved in the immediate and longer term responses. Mental health professionals can contribute to planning by incorporating past research on disasters in order to identify psychologically vulnerable populations within the community and to provide insight into how people can be expected to react to warnings, as well as during and after events.

2. Mitigation

This phase focuses on prevention or reduction of the threats identified in the first phase. This could involve the implementation of stronger safety codes (such as strengthening building standards in an area with significant seismic risk), the relocation of at-risk populations (such as those living in flood plains), or the improvement of individual preparedness (such as developing a campaign to encourage residents to create family emergency plans). Mental health professionals can help to identify potential sources of resistance to mitigation efforts, and to structure messages to improve compliance.

3. Response

During the response phase, the emergency plans are implemented in reaction to an actual or expected event. The focus is on containing physical damage (such as putting out fires or stabilizing structures), saving lives and treating the injured, ensuring that survivors' basic needs for shelter and sustenance are met, and restoring essential services like power and communications. If an event was expected, mental health professionals may be present during the response phase, for example, to provide Psychological First Aid and early assessment as displaced residents arrive at shelters. We also may provide mental health support to emergency responders and managers to help maintain workforce resilience in a time of great stress.

4. Recovery

Efforts in the recovery phase focus on returning the community to its pre-event condition if the event was fairly small, or on creating that new normal since changes from a large-scale event are often permanent. While this work generally occurs at the local level, many outside organizations may be involved, providing financial and material resources as well as services such as feeding and sheltering. Mental health professionals play an essential role during this phase.

5. Evaluation

Finally, a careful evaluation of the entire event should be conducted. Were the plans thorough and appropriate or did gaps become apparent? Can additional targets for mitigation be identified in hopes of preventing or reducing harm from a repeat event? Were the response and recovery efforts carried out as planned, or were there lapses in communication or other problems of implementation? Every aspect should be considered thoughtfully—and the conclusions should then be incorporated into updated plans, completing the cycle. It would be regrettable if personal defensiveness were allowed to get in the way of maximizing preparedness, but many people are not comfortable having their actions closely examined. Mental health professionals can assist in this evaluation by reminding those involved that this is not a critical assessment of individual or agency performance (unless, of course, that's warranted by some actual failure) but an opportunity to improve and protect the community better in the future.

As this cycle demonstrates, the actual emergency response falls in the middle of the disaster management continuum. Skimping on the pre-event phases of planning and preparedness and mitigation is likely to mean that a community will be ill-prepared to handle a disaster; failing to evaluate the strengths and weaknesses of the response and recovery and to incorporate that feedback into plans means subsequent responses will be less effective than they might have been.

Disasters vs. Routine Emergencies

A brief point before we move on to the characteristics of disasters: From the response perspective, what qualifies as a major disaster in one setting could be less disastrous in another if there are adequate resources to respond to it. Every community has first responders who are equipped to deal with some level of "routine emergencies"—firefighters, EMTs and paramedics, and law enforcement agents who respond to car accidents, house fires, individual assaults, and other emergencies. But when an event's demands

exceed that local capacity in terms of personnel, skills, and equipment so that additional support must be brought in from the outside, suffering is likely to increase during the response, which means that subsequent emotional reactions are likely to be worse.

For example, imagine a serious bus accident in a large city versus a rural setting. Even if the number and severity of injuries were identical, the quick access to skilled responders with adequate rescue equipment who can rapidly transport victims to trauma centers throughout the city is likely to result in fewer casualties than in the rural setting, where victims may need to wait longer for help to arrive and then be flown to hospitals in multiple surrounding counties. Does the incident still feel like disaster to those in the urban version? Of course it does, but having their needs attended to quickly is likely to at least mitigate emotional distress as well as physical suffering. Bear this in mind when you start to think about potential events in your own community and what resources might be available to address them. Will a certain incident be manageable like a routine emergency or will it overwhelm resources and turn into a disaster?

Disaster Characteristics

As we've seen, the variety of disasters is vast and it would not be feasible to have a specific response plan for each particular type of event. Instead, emergency responders generally take an "all hazards" approach based on a general plan that can then be tailored to the specific type and timing of an actual event. We'll take a similar approach on the mental health side: Rather than teaching you how to help the survivor of, say, a hurricane versus a terrorist attack, we'll focus on certain key characteristics that research has identified as tending to influence survivors' psychological reactions to their experiences. As we'll see, what matters is less the specific type of disaster than factors such as event size, cause, and timing. Those patterns provide an important basis for understanding how a specific event is likely to affect people, but it's essential to keep in mind that survivors are individuals first.

Specifically, each person you'll encounter had different pre-disaster strengths and challenges; each person had a different private experience of the event; and each person will have access to different resources to assist in their recovery. That may seem obvious, but it's easy to lose sight of when you're dealing with large groups of survivors after a major disaster. It can be tempting to adopt a one-size-fits-all approach to interventions, but that's likely to misallocate limited mental health resources by directing unneeded attention to some people who already have sufficient personal resilience or access to support, while depriving others of the full level of assistance they could benefit from. It's essential to bear in mind that any one survivor's reaction will be an **interaction between the characteristics of the disaster, the individual, and the response**.

PREDICTORS OF SURVIVOR REACTIONS: VARIABLES TO CONSIDER		
Disaster characteristics	**Individual characteristics**	**Response characteristics**
• Was it human-caused or natural, or a combination? • Was there a warning period? • Was there a clear end-point to the disaster, or uncertainty about it recurring or about its long-term health effects? • How widely was the community infrastructure damaged (scope)?	• If there was a warning period, did the individual take protective action? • How directly was the individual impacted? (i.e., injury, loss of home, death of loved one) • Did the individual have pre-existing strengths or vulnerabilities that might impact response? • Does the individual have an intact support network to draw on? • Did the individual have previous disaster experience?	• Did the community have pre-existing resources to aid recovery? • How were survivors treated immediately after the disaster? • How were survivors treated in the longer-term recovery stages?

With that said, there are some evidence-based correlations between those disaster characteristics and typical emotional reactions. Let's now examine the characteristics that tend to influence survivors' mental health.

Specifically, relevant characteristics include categorizing disasters by **size**, by **cause**, and by whether they were **expected or not**. Additionally, the **timing** of the event can influence both its logistical and emotional impact.

Disaster Size

Scope, intensity, and duration all measure different aspects of the size of an event. In essence, they describe how **big**, **bad**, and **long** the disaster was. Note that there are no standard definitions for these characteristics (for example, there's no official number of fatalities that qualifies an event as low versus high intensity), and that the notion of available resources relative to demands certainly will influence the response.

Scope can be thought of as a measure of the breadth of damage caused by a disaster. It describes how extensively the larger community is impacted, including the rescue and support infrastructure, which in turn predicts how much help is available and how quickly recovery can proceed. In an event with a large scope, survivors may be unable to turn to their normal support systems of friends, family, and neighbors as they would after a smaller scale traumatic event, since those people may be dealing with their own recovery needs. Very large scope events, like Hurricanes Katrina and Sandy, or the 2010 earthquakes in Haiti and Chile, may leave survivors without a place to shop, work, go to school, or pray. Many may be forced to relocate in order to find housing, work, and schools, which adds the emotional stress of resettling and losing one's community on top of the direct disaster losses.

Intensity refers to level of damage in terms of injuries and deaths—the event's human cost. Of course, any serious injury or loss of life will feel tragic for those directly affected, but disasters that cause multiple losses can compound distress for everyone involved, including professional responders who may suffer secondary trauma from exposure to many injured people or dead bodies. The effect of losing multiple loved ones goes beyond pure addition: Someone whose child and spouse were both killed in a disaster is not only grieving two deaths at once, but he or she may have lost what would have been the main source of comfort in grappling with the death of a child, as well as a chief reason to keep on going in coming to terms with the sudden loss of a partner. As a result, people who experienced multiple losses are at the highest risk of a difficult bereavement process and readjustment and should be a focus of early mental health attention.

Scope and intensity are often linked, but not always. An event may be large in both, or large in one measure and small in the other. For example, a hurricane or ice storm may cause extensive property damage, but if warnings were provided and complied with, the human cost may be minimal. In contrast, an event like a fire in a nightclub can cause extensive casualties but affect only one building, leaving the rest of the community's physical infrastructure intact as it copes with the human loss.

Duration may be thought of in multiple ways. First, it can refer to the length of the disaster itself, which could range from seconds for an earthquake or explosion, to hours or days for a hurricane or blizzard, and even to weeks for a slowly advancing and receding flood. Or we can think of duration as the length of time people are affected by a disaster, including the recovery period as physical damage is repaired and losses are adjusted to emotionally. In the case of very large scope events that could take years, or could never be fully completed.

From the mental health perspective, the most useful way to think about duration falls somewhere between those two measures: It's the length of time until survivors begin to *feel safe* again. Real recovery can only begin when survivors believe that the imminent danger has passed, but sometimes that point is not clear. In addition to the threat of additional physical harm, ongoing uncertainty about whether an event is truly over can greatly compound distress, since survivors never know when they can let their guard down. Survivors of earthquakes often sleep outside for fear of aftershocks. Terrorist attacks are often organized simultaneously or in sequence, leaving survivors wary of repeat attacks. Exposure to biohazards may cause great anxiety about long-term health effects. In any event without a clear end point, survivors may remain in a state of heightened vigilance that interferes with their ability to recover emotionally from the initial experience.

Scope, intensity, and duration tend to be correlated with the degree of impact on professional and community response systems: Are there enough emergency responders to contain damage and rescue survivors? Can area hospitals handle the number of injured people? Can schools and workplaces reopen quickly? Are people displaced for extended periods of time?

While the resulting logistical difficulties are obvious, there's also a clear mental health connection: All three measures tend to predict survivors' reactions in what is referred to as a "dose-response relationship," meaning the bigger the dose of disaster a person experiences, the worse his or her psychological reaction tends to be. Therefore, in assessing mental health needs post-disaster, survivors whose disaster experience was particularly intense or long lasting are likely to require more support than those who received a smaller dose of trauma.

Disaster Cause

While the relationship between dose and response is fairly clear-cut (more = worse), the impact of a disaster's cause is more nuanced—as is the division between causal categories. The most basic way of classifying disasters is as natural or human-caused. However, this is a more complex divide than might be evident, since natural events can trigger secondary technical disasters (referred to as na-tech events), and human-created conditions can limit or increase damage resulting from natural events. For example, in Hurricane Katrina the storm was obviously natural, but the flooding of New Orleans was caused by the failure of levees due to human error and neglect. In Japan in 2011, a natural earthquake and tsunami led to the meltdown of a nuclear power plant that displaced hundreds of thousands of residents.

We noted earlier the impacts of climate change and population growth. A large wildfire in an unpopulated region might have little human impact; only after people decide to build in these areas does the potential for property damage and injury or death exist. Should that be considered natural or human-caused? Should increased flooding caused by higher sea levels as the atmosphere warms and polar ice melts be considered natural or human-caused?

Another factor that blurs the line between causes is differences in building practices. The massive devastation and death toll of over 230,000 caused by the magnitude 7.0 Haitian earthquake in early 2010 was largely due to the use of unstable building materials and designs, resulting in the collapse of countless structures. In contrast, the 8.8 magnitude Chilean earthquake six weeks later was 500 times more powerful, yet the death toll was below 1,000 since strict building codes kept most buildings standing long enough for people to escape. Therefore, the built environment can affect the intensity of damage caused by a naturally occurring event. We should also note that there has not been a death due to fire in an American public school in over 40 years. This is because fire departments and the general public have demanded and achieved rigorously enforced fire codes in US schools. This is a triumph that could serve as a model for other efforts at prevention.

Another type of disaster, public health emergencies, can be either naturally occurring such as pandemic flu, or intentionally caused, as in a bioterrorism attack. Even when they are natural in origin their psychological impact is closer to human-caused events.

As these examples illustrate, there's not always a clear divide between causes. However, for those events that can be classified as natural or human-caused, research has identified certain typical emotional reactions. In particular, differences in anger and blaming are often seen.

Natural Disasters

In general, people tend to have an easier time recovering emotionally from natural disasters such as weather events. These events are recognized as unpreventable and not anyone's responsibility. There is no one to blame, except possibly God or a higher power, so adjustment is often facilitated because survivors don't typically have anger or a desire for revenge compounding their losses.

However, the negative side of that lack of preventability is the recognition that one is powerless to stop a similar disaster from happening again in the future. As a result, survivors of natural disasters may feel helpless and unable to protect themselves, which can be very distressing in a culture that tends to emphasize feelings of personal control.

People may overextend this sense of helplessness well beyond the disaster itself, feeling like "I'll never be able to rebuild and if I do another hurricane will just come along, so why bother?"

Natural disasters may either strengthen religious people's faith if they feel God has protected them, or shake it as they struggle to understand why God caused the event. This loss of a past source of comfort and sense of trust in a benevolent deity can be very upsetting for survivors, and enlisting spiritual care providers in a mental health response plan can help to address it.

It should be noted that when a natural disaster is very large in scope or intensity, the relative protection of the cause tends to fade out and emotional reactions may be as strongly negative as for human-caused events. That exception aside, psychological reactions following smaller scale natural disasters tend to involve less distress than responses to events that are clearly human in origin, with **helplessness** as the most typical troubling emotion.

Human-caused Disasters

Human-caused events, such as transportation disasters, industrial accidents, mass shootings, and terrorist attacks, are generally associated with more psychological distress among survivors. Realistically or not, these events are often perceived as preventable, so survivors experience **anger**, plus a strong need to lay **blame**. They usually want to identify whoever is responsible and punish them, either through the judicial system or by seeking revenge or retribution.

That urge to blame can be extremely strong, and for some survivors it becomes a driving force, squeezing out any focus on adjusting to the original loss. This blaming often extends beyond actual perpetrators to include authorities, who survivors perceive as having failed to recognize the potential threat and stop it. In hindsight it's often possible to pinpoint someone who truly might have done better at preventing a human-caused disaster, whether that could have been through legal action like the capture of suspected terrorists before they had a chance to act or through the creation of safety policies to prevent accidents. If an official scapegoat is identified, survivors may feel betrayed by authorities who they believe failed to protect them as well as by the person or people directly responsible for the event.

This can be viewed as a coping mechanism: Finding someone to blame and punish gives survivors a perception of control and a belief they can prevent the event from recurring, as well as a sense that someone can be made to pay for their losses. However, it can also lead people to become so fixated on their anger and need for justice that they don't come to terms with their disaster-caused losses and become stalled in their recovery process. And if survivors perceive that justice isn't being done, they may lose faith in humanity in general and need to learn to trust again.

It's also essential to recognize that within the category of human-caused events there are different degrees of **intentionality**, from accidental to negligent to intentional, and this can clearly affect psychological reactions. A plane crash caused by pilot error is likely to elicit more anger and blame than one caused by birds hitting the engines—and one caused by a terrorist act or pilot suicide and murder will be far more difficult for most survivors to come to terms with than one caused by unintentional error. While events caused by accident or negligence may lead to blame of the individuals perceived as responsible, or to a demand for changes to systems that permitted the failure to occur,

these responses are not likely to be as intense or long-lasting as those resulting from intentional malevolence. There are few things harder to accept than the idea that someone has intentionally harmed us or our loved ones, and knowing that one's suffering has given someone pleasure or advanced their political or personal goals can be devastating psychologically.

In addition to their obvious intentionality, terrorism and the use of weapons of mass destruction (those designed to produce large-scale harm via poisonous chemicals or radiation, or by intentionally spreading disease) are also very difficult to cope with because of the great uncertainty around them. We generally have a fairly clear understanding of what to expect during and after most other disasters, but when it comes to acts of terrorism, survivors often don't have a sense of their true scope or duration, making it hard to process the experience and begin to recover. People also may be concerned that they've been exposed to a substance that will make them sick even years later. This uncertainty is stressful, and compounds the known losses suffered during the initial attack. Also, disasters caused by criminal behavior often necessitate legal proceedings against suspected perpetrators that can go on for many years. Research has shown that these proceedings (arraignments, trials, sentencing, parole hearings) often bring about a resurgence of symptoms in survivors. Therefore, survivors of acts of terrorism or other intentional crimes should be viewed as being at high risk of serious post-traumatic reactions and targeted for early mental health interventions.

Public Health Emergencies

Whether they're caused by a naturally developing disease like influenza, an accidental release of radiation or other toxins, or an intentionally introduced act of bioterrorism, public health emergencies create some specific stressors for responders and for those who have been exposed—or merely fear they might have been.

Above all, the **uncertainty** around this type of threat is extremely upsetting. In most disasters, whether natural or human-caused, we know immediately if we've been physically harmed. That's not generally the case with diseases that may have an incubation period of several days from exposure to the development of symptoms, and it's certainly not the case where exposure to a toxin may result in cancer, lung problems, or other health issues only years later.

For some people the thought that they may have been exposed to something harmful, but don't know for certain, can be terrifying, so public health emergencies often produce large numbers of "MUPS," or people with Medically Unexplained Physical Symptoms (formerly referred to as the "worried well"). These people may interpret the physiological expressions of their stress reactions (such as a pounding heart or shortness of breath) as symptoms of the disease they fear they're developing, and they may flood emergency departments or healthcare clinics that already have their hands full dealing with those who are actually suffering from the condition in question, as well as with their ordinary flow of patients.

Mental health professionals may need to help respond to MUPS to prevent them from unnecessarily consuming medical resources, as well as to assist with managing crowd emotions and behaviors at settings like Points of Dispensing (PODs) for large-scale distribution of vaccinations or medications, or at decontamination sites. These experiences are unfamiliar to most people and may create concerns about additional exposure in addition to worries about side effects of the treatment. For example, during the 2009 emergence of the H1N1 influenza pandemic, many people resisted getting vaccinated

because of media-fueled rumors that the vaccine was unsafe—even though it used the exact same technology as seasonal flu vaccine development and production. This kind of fear is an emotional reaction, but it can lead to very real health consequences if it causes people to avoid necessary prophylaxis or treatment.

Above all, remember that most people have limited understanding of disease processes or treatments. For example, many are uncertain about the difference between vaccines and antiviral medicines. They also don't understand the difference between *isolation* that separates sick people with a contagious disease from people who are not sick and *quarantine* that separates and restricts the movement of people who were exposed to a contagious disease to see if they become sick (Centers for Disease Control and Prevention, 2015). Therefore, public health emergencies tend to create both personal worry about becoming sick and a susceptibility to rumors or misinformation that will be compounded if accurate information is not provided in a timely, credible, and comprehensible manner. Mental health professionals may be limited in our ability to respond to the actual health threat but we can contribute by obtaining and disseminating accurate information, and by preparing for and intervening in the cognitive and emotional distress public health emergencies cause.

Expected or Unexpected

A third major factor associated with typical psychological reactions is whether a disaster was expected or unexpected. This factor primarily means whether the disaster allowed for a specific warning that it was approaching, but to some degree expectedness applies to simple recognition that a type of event is even possible.

Expected Events

Expectedness is partially correlated with causality. Many natural disasters offer a warning period, but some, like earthquakes, do not. For those events that do allow warnings, the length of the warning periods varies widely, and as a result so does the type of protective action possible. Major storms can be predicted with reasonable accuracy days in advance, allowing for evacuation and the advance opening of emergency shelters, while tornado warnings might allow a few minutes' notice to seek safety.

This is a mental health issue because survivors generally demonstrate less intense emotional reactions to expected disasters. Of course, in part this is because warnings provide an opportunity to evacuate, seek shelter, or take other protective action and avoid or minimize the dose of trauma received. Apart from that obvious practical protection, receiving a warning also allows for some psychological adjustment to the idea that a threat is approaching, rather than blindsiding people.

However, warnings are not without a downside. Essentially, receiving a warning places the recipient in an unpleasant decision-making situation: Will they comply with it or not? Choosing to comply means first acknowledging that a potential threat to life and property is approaching, which is not something most of us readily embrace. If we do accept the threat as legitimate, most recommended protective actions are onerous in terms of time, money, effort, and distress. As a result, the typical tendency after receiving a warning is to deny that one is at risk and to disregard it, or to wait to collect more information—sometimes until it's too late to take the most effective action.

If people receive a warning and they fail to take action, they're likely to experience guilt and shame later from the recognition that they could have avoided some losses, which of course is devastating if those losses include the deaths or serious injuries of loved ones.

Survivors may then have to cope with self-blame, as well as blame by others who question why they didn't heed the warning. These can be powerful emotions that complicate recovery, as survivors must learn to accept that part of their losses were due to their own decisions. However, vowing not to repeat that mistake and to follow subsequent warnings can provide them with some perception of control over the future.

It's also possible that survivors might take reasonable steps in reaction to a warning, only to discover that they were insufficient. For example, before evacuating in response to a flood warning, residents might place valuables in high locations within their homes. If the floodwaters rise higher than expected and the items are destroyed, survivors might still engage in self-blame that is unreasonable—they *did* take precautions they believed would be appropriate—but nonetheless distressing. Residents in disaster-prone areas like flood plains may also engage in self-blame because they know they made a choice to live in harm's way. In the case study described at the beginning of the reading we saw that after a false alarm concerning the approaching wildfire, survivors were less likely to take precautions when there was a subsequent warning. We could reassure them that their actions were typical and understandable. False alarms often create an impression that warnings are exaggerated which leads to less compliance to subsequent alerts. Hopefully this would mitigate their self-blame.

Unexpected Events

Most human-caused and technological disasters do not have specific warning periods—if they did, the events could potentially be averted, or at least people in the area could be protected from harm. However, there may be recognition that an event is at least possible, which can allow for some logistical and psychological preparation. For example, those living near levees and dams probably have some idea that breaches are possible; those working in buildings that would be high-value terrorist targets may be aware of that vulnerability. That theoretical awareness can help people function more productively during a disaster than they might in response to a completely unforeseen event, but obviously it offers less protection than an actual warning period does.

Since people who experience unexpected disasters have no chance to prepare physically or psychologically, they're more likely to be overwhelmed during and after the event. They also may feel helpless or vulnerable to a recurrence: If a traumatic event occurred once with no warning and with nothing they could do to prevent it, that can happen again and there is no way to protect oneself or one's family in the future. There should be less guilt in this group since there was no warning to respond to and so no need to blame oneself for failing to act. However, people often feel or express guilt over things they could not realistically have foreseen or controlled, such as "I should have seen it coming," "we never should have bought that house," "I shouldn't have let him get on that flight," and so on. Even if these thoughts are implausible, they still cause very real pain to survivors, so mental health interventions might include gently correcting these distorted cognitions.

Timing

A final characteristic to consider is the timing of the disaster, which can influence its severity, the speed and success of the emergency response, and the distress it produces.

Time of day obviously determines whether it's light or dark during the event and the immediate response and recovery efforts. Especially if electrical power is lost, darkness can increase the risk of injuries and complicate rescue activities. It can also cause disorientation and increase fear and anxiety as people try to help each other or wait for

assistance. On the positive side, families are more likely to be together at night, whereas during weekdays they're typically apart, with parents at work and children at school. Being separated during a disaster causes tremendous anxiety and often results in parents rushing to locate children, potentially clogging roads needed by emergency responders and creating traffic flow problems at schools.

Time and day may impact other logistical factors, which in turn affect the dose of trauma survivors may receive. Does rush hour traffic slow the ability of survivors to escape a disaster site or of emergency responders to reach it? Are hospitals fully staffed or at nighttime personnel levels? In areas with volunteer fire departments and ambulance corps, are responders available to report to a firehouse or disaster scene quickly? Are children in transit on school buses and even more difficult for anxious parents to find? Does a shift change mean twice as many factory workers are present during an industrial explosion? These timing questions can influence the ability of responders to help out effectively, as well as the emotional impact of experience.

Of course season is directly connected with certain kinds of disasters (hurricanes, blizzards), but season and climate can also impact conditions in the recovery period, particularly sheltering needs. For example, when a major earthquake struck in the mountains of northern Pakistan in October 2005, the combination of high elevation and approaching winter meant that providing warm temporary housing was essential to survival. In contrast, Haiti's tropical climate meant that emergency sheltering after the 2010 earthquake did not need to provide heat—however, the approach of the rainy season three months after the disaster meant that tents and tarpaulins did not provide adequate protection for homeless survivors for long.

Weather can have other effects as well, positive or negative. The brutal heat following Hurricane Katrina certainly increased the suffering of those who were displaced or awaiting rescue and increased the number of casualties. In contrast, when US Airways Flight 1549 landed in the Hudson River, the clear skies and daylight facilitated the rescue of the passengers, which might have been far less successful at night or during a winter storm.

Is this a mental health issue? The principles of Psychological First Aid clearly tell us that people's physical needs must be attended to before they can benefit from mental health interventions. If people are extremely hot or cold, feel physically unsafe, or lack adequate shelter, food, and clothing, they'll be unable to focus on anything beyond these immediate needs. Therefore, addressing the effects of these logistical conditions must be considered a first step in mitigating psychological reactions to trauma.