



From PPN Learn Curriculum: Pediatric Considerations in Disasters for Resource-Constrained and Rural Settings

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Module 1: Disasters and their Impacts on Public Health

Transcript

So I'm going to do Module One first: Disasters and their impacts on public health.

There are three components of a disaster. It's an event that often, but not always, occurs suddenly and unexpectedly. It causes trauma to people and/or severe damage to the environment. But the key thing I want to impress on you is that it exceeds or overwhelms the response capacity of the affected community.

Why are we doing this within the context of a course in global health? It's because the capacity of many low- and middle-income or low-resourced countries is so stretched—not only their healthcare system, but their first responder system and their ability to respond to these disasters is so limited—that often situations become real disasters or problems because you're superimposing this emergency on a system that's already stretched so thin it can't handle it. So if you're going to do global health, I think it's really worthwhile to understand the basic concepts that go with disasters and emergencies.

As Joe and Lisa probably told you, while there's a section of this course that tries to give the clinicians—nurses, physicians—a sense of how to manage certain things, and the course in a sense is geared towards medical students, fellows, and physicians, it also gives our public health people and those who don't have a clinical background at least some understanding of what's necessary and needed as you respond clinically.



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I know people have said it: if you're a public health person, don't worry, we don't expect you to be able to manage blast lung and shock and whatnot. But the triage is simple enough that you can understand the components of triage and the importance of triage. And you can understand why first responders have to be able to recognize this. So there may be six or seven public health people here. Please, again, don't panic. You're not going to fail this course because you don't know how to stabilize a patient.

Okay, now these are key definitions, and these key definitions are a little bit different than what we normally think. We talk about a hazard, and a hazard is a potential threat to public health and safety. I didn't say a potential threat to people dying—it can be, but it's broader than that.

So here we are in Colorado. How many people grew up in Colorado? Raise your hands. Okay. What do you think are the hazards in Colorado? Anybody? Avalanches—great. Forest fires are probably the big one. And if you grew up in Colorado or if you've been here for a while, remember—if you live along a stream, like up towards Fort Collins, the Poudre River and whatnot—there were floods several years ago, major floods. And there are areas of Colorado where there are tornadoes. If you live in San Francisco, you'd be worried about earthquakes, as well as certainly forest fires if you lived in Sonoma or Napa. So that's a hazard.

It's important to understand in your area what the hazards are. If you're in the mountains of Pakistan, you need to recognize that earthquakes are occurring almost every year. It's a question of whether they're going to occur in your area.

Now, an emergency is an actual threat to public health and safety. So an emergency has occurred. The tornado has occurred. The earthquake has occurred. The coronavirus SARS-2 epidemic has occurred.

Now, here's the word that's a little tricky. Risk is the consequences of the exposure to the hazard. So think of risk as the impact of what's happened.

What are some of the risks of what can happen? Loss of life, hospitals destroyed, homes destroyed, food, the crops in certain areas destroyed. So think of impact as risk.

Vulnerability is the determinants of risk. So if you're in California and you have laws that require building permits to withstand a certain level or intensity of an earthquake, then your vulnerability is less than if you're in Haiti and you have substandard construction—or in China. I don't know if you remember about 10 or



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15 years ago, the schools where it was shoddy construction and those schools collapsed and killed many, many children.

Capacity is the way the community copes and responds. When Katrina hit, the capacity of Louisiana and the city of New Orleans to respond wasn't very good. When you think about Puerto Rico, their capacity to respond, rebuild their electric grid, and get food and shelter and whatnot.

So the risk or the impact equals the hazard—the likelihood of something happening—times the vulnerability (how likely it is and what their situation is), over their capacity. So if they have a low capacity, and if their vulnerability is great and their capacity is low, and they're at risk for an earthquake or a flood or an outbreak of MERS or whatnot, they're in trouble.

Here are some of the hazards we talked about. Slow-onset hazards: flood, drought, famine, chemical spills, epidemics. Sudden-onset: earthquake, cyclones, hurricanes or cyclones, flash floods, major accidents.

Impact or risk includes deaths, populations that get displaced. And remember, if you're up in the mountains and you get displaced to the lowlands and you've never seen malaria or dengue, you're in trouble. New cases of disease and disabilities, exacerbation of cases of psychologic and social behavior disorders, food shortages, environmental hazards, damage to healthcare facilities, schools, and other facilities.

The problem is, when you need to divert resources to handle the emergency, then those resources are not available for other economic and social development. In a way, with COVID, it's like where there are hotspots—as you fill up your hospital beds with COVID patients, if someone has a heart attack or needs surgery, the capacity isn't there. So that's what we mean by displacement or diversion.

This just kind of reviews the kinds of triggering events, the kinds of hazards and emergencies. There are climate and geological ones, especially with global warming. But human-derived triggering events: industrial accidents, oil spills like just occurred off the coast of California, repression, terrorism, complex emergencies, civil war. And what we've found is the human-origin events keep increasing.

It's important to understand the concept of vulnerable populations, because as we respond to these emergencies, we need to know who's most vulnerable and how we structure the response that protects these vulnerable populations. They include



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children and youth, women who are pregnant, breastfeeding, or alone, the elderly, and the disabled.

The problem with children is that their parents are so overwhelmed that they're not able to provide their children with the emotional support that they need. They're hanging on by a thread, okay? And they're looking at their losses—brothers, sisters, other children. So children's psychological needs and stress are often overlooked. That's why Colorado now has the highest child suicide rate in the country. And if you look nationally, the frequency of children's emotional problems and suicide has skyrocketed.

But there are other risks for children, and that includes victimization. Children that are raped, tortured, robbed. You see this a lot in the children who come accompanied or unaccompanied trying to get into the United States from Central America, from further south, from Haiti. These children who come on these trains or walk in these large groups are often victimized and exploited for slave labor and child trafficking.

And more and more, there was just an article in Afghanistan about this school that ISIS is running on NPR—eight-year-olds that are watching decapitations, how to throw grenades, how to fire automatic weapons.

So what are the phases of disaster management? Preparedness, emergency response, recovery, prevention, mitigation.

What do we mean by preparedness? Risk assessment and vulnerability. We live in this community—what are the risks? What can we do to reduce wildfires? What can we do to reduce flooding? How vulnerable are we?

How do we manage information in terms of—if something were to happen, what would the communication channels be? How do we do policy and planning in a way that integrates the various sectors, and that people know what role they have to play? So it's not just a book that's put on a shelf, but that the various important components—police, fire, first responders, healthcare system—all have an understanding of how they relate.

How do we mobilize resources? How do we coordinate and partner between these different sectors? How should schools, rotary clubs, service organizations, churches—how could they be involved in a positive way? And how do we put it all together in training and simulation? That's something that in Joe's role at Children's, they're running simulations all the time. We have to have people be prepared at Children's Hospital, but every few years or every year, we run a larger

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simulation that not only includes Children's Hospital, but these other involved entities.

Now, the emergency response. The first part is notification—telling other resources and other entities what's happened. And then we have to be able to manage the information that comes in in a timely way. We need to coordinate the services. We need to make sure we start the search and rescue, because in many situations, time is of the essence. If there's an earthquake, we've got to get people out who are still alive as soon as possible.

We need to do needs assessment and damage assessment, and especially if there are areas that are not safe, we've got to move people from those unsafe areas. Evacuation and sheltering, resource mobilization—this is all part of the emergency response phase.

After the situation's been stabilized, the third phase is recovery, and the goal is to get those communities back. One of the most important parts of recovery is giving the community and people living in it a sense of a future. One of the major problems with recovery is the paralysis that results from a sense of hopelessness.

So we have to reestablish self-sufficiency, community planning, infrastructure rebuilding, recovery of the health of the population, community sense of togetherness. There have been studies that have shown that when communities have a sense of togetherness, a sense of helping one another out, a sense of friendship that goes beyond the family unit—when there's not a clan issue or divisions—the community pulls together and recovery occurs in a much faster way.

And what I said: hope for a better future. People need to have hope, and hope brings resilience.

Now, the last part is prevention and mitigation. We have to learn—the community, an area—has to learn the lessons from that disaster. It has to reassess its preparedness and strengthen its preparedness. And it has to embark on risk reduction and doing the trainings that will prepare it for the next emergency, because the next emergency is definitely going to come.

Okay. That's Module One.