Module 2 - Health Consequences of Disasters

(0:06 - 0:48)

So now I'd like to talk to you about module two of our series, Health Consequences of Disasters. After completing this lesson the students will be able to, number one, describe the six common disaster myths and also to recognise the two key clusters of disaster consequences that commonly affect health. We'll also learn to recognise the difference in health impact for man-made disasters as compared to natural disasters and also to identify the major health consequences of natural and man-made disasters.

We'll also recognise that different disaster hazards often cause the same health effects. So let's start off with six common disaster myths. Number one, most common disaster myth, that disasters always cause epidemics.

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Don't get me started. That is always the case. People always think that and it's rarely ever true.

Disasters rarely cause epidemics. As a matter of fact, earthquakes very, very rarely. What we see, epidemics are commonly associated with conflict disasters.

In other words, wars or civil wars and those kinds of things that affect a population, destroy the health care infrastructure, the public health infrastructure, and so on. And people go a long period of time without health care, food, adequate shelter, and so on. And therefore, they have a lot of other factors that cause these epidemics to occur.

But we don't normally see this after other types of disasters. Very, very, very rare after earthquakes, tsunamis, landslides, and so on. We see it on occasion with floods and some of the other types of disasters, but once again, don't always cause epidemics.

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So we shouldn't be wasting our time of trying to plan for epidemics or dealing with epidemics in the middle of an earthquake when the real issue is injuries and shelter. The second most common disaster myth is that mass hunger always happens after a disaster, and once again, very rarely the case. Now we do see examples where countries that have difficulties in feeding the population or a very tenuous food distribution system before the disaster, that when the disaster comes, that tips them over the edge.

But rarely do we see mass hunger or this type of starvation event in most disasters. The one that we is the exception of that, of course, is drought, where we see long-term drought and then famines that commonly occur. Most of the time that occurs in Sub-Saharan Africa where there's a chronic drought and famine cycle.

So the third most common disaster myth is that temporary shelters like tents are always the best alternative when homes are destroyed, and this is never the case, actually, very rarely if ever so. You know, usually people are wanting to get back into the norm, their normal routine, their normal family unit, and when you take a family and you put them in a room full of 600 people in one room shelter, great big huge sheltering experience, or many, many tents and so on, that's not their norm. And so people react to that.

They're not back to the normal, they're not experiencing the normal things that they've been so used to in their lives. The families are disrupted and so on. So rarely is this the case.

As a matter of fact, in one particular country, they had an earthquake that occurred and people were displaced from that and all put into shelters and so on, and the government came to them afterward and said, look, you know, we have this sort of a longer-term solution to move you out of the temporary shelter and move you back into these different neighbourhoods. And when they went to this one particular group of people and they asked them, you know, to get ready to move, get ready themselves to move back, then the people actually said, you know, well, wait a minute, we're all moving to different places and we used to be a neighbourhood. And that's a big important issue when you start moving people out, moving them to different areas.

You're disrupting that sense of community, that sense of home and of purpose and sharing and all going through the same experience, disrupted and now maybe even lost forever. So the idea that these temporary tents, shelters, and so on are really not the answer. What we really need to be thinking about is hosting communities where people can come into other communities, live in other homes, share their shelter with other families and so on, or maybe in long-term settlements or interim term settlements where people have more of an alternative as opposed to just the tent.

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Obviously, tents are needed in many cases, especially in those early days, but we should be thinking every time we establish a temporary shelter of getting people back to a normative process, a normal, everyday kind of routine that's a little closer to what they had before the disaster. So the fourth most common disaster myth is that foreign volunteers with any medical skills are urgently needed, and this is also rarely the case. People come in from any type of medical care, whether it's surgeons and so on, that may come in.

What we find is actually that it's never needed days that are two weeks, three weeks after the disaster, that most of the time actually those medical injuries, those surgical needs and so on, are really affected in the very first day, sometimes in the first few hours, and that foreign volunteers that may have certain medical skills may not always fit in with the other types of disaster needs that this population has. And now the fifth most common disaster myth is that the international community should immediately send anything that it can, and this is such a big mistake. You know, we have to think about the social aspects of where people are living, the disaster victims and so on, the cultural aspects of what they need from us as well.

And so, you know, people want to give, and all over the world people are the same. They're very giving, they want to be able to take the very shirts off their back and send it, and many times they do that. But it's not always appropriate in different cultures.

For example, people that live in temperate climates may want to send winter coats and winter clothing and so on, or people in a Western society may send to other societies where the clothing is different. It's not the same clothing for women or men, and it may not be appropriate for their particular culture. Or they may send a different type of technology or different types of foods and so on that may not be appropriate for everyone.

So we really have to think about, are we really asking the people first? What do they need? What do they normally use? And how can we replace that as opposed to carrying some sort of cultural change, or anything that we can get to them should be good enough. That's never the case, and actually it's not good enough to do good. We must do good well, and we really have to think in terms of that when we're talking about this international aid.

The final and sixth most common disaster myth is that things are back to normal in a few weeks, and that's also rarely ever the case, if not never. What we really see is people don't get back to normal in months, and they don't get back to normal many times, even in years. If we look at, for example, the people in Hurricane Katrina, people's lives are still disrupted even though that happened many years ago.

Superstorm Sandy, other types of disasters including Hurricane Mitch in Central America, or Indonesian tsunami, same kind of issue when we're talking about long-term recovery. So long after the cameras and the news crews have all packed up and gone away, long after the responders have left, people are still trying to recover their life to get back to normal. And as we'll learn more in this particular session, in this particular module, we'll learn more about what that normal means, and how it really takes not only weeks, but it takes months and years for people to really get back to the life, to the holistic approach of what they really need to get their life what they say is the way that they want it.

So I want to talk to you about these two key clusters of disaster consequences that affect our health. We can sort of conceptualise all the consequences sort of in these two key clusters. One of them is caused by when you lose your shelter, and the other is caused by when you're exposed to the health hazard.

So this health hazard, for example, may be hurricane winds, or water, or chemicals, or those kinds of things. That's the hazard, and you're being exposed or close proximity to that. And that results in morbidity, or injuries, illnesses, and also mortality, or deaths.

So we have this exposure that then results into a large number of injuries. The medical system has to respond, or a large number of deaths. The community responds in that way.

In the same token as well, loss of shelter also has a trickle-down effect. It has this cascading

effect that also impacts food security, water, sanitation. If you don't have your home, you lose more than just your ability to shelter.

You lose your ability for food preparation, for bringing food home, storing food, and those kinds of issues, as well as water. Safe water is not only important for drinking, but also cleaning, doing your dishes, taking showers, washing your hands. All of those things affect our health.

So when we take these two clusters, we can really see that they make a cascading difference. And when you lose those, and have one, or the other, or both, you really have much more of an incremental effect in disaster consequences. So now let's talk a little bit more about these figures of the relative impacts between natural disasters and technological disasters.

And the way that I remember it is blue is blue like the sky, so that's a natural disaster. And technological, more like fire or explosion, that's red. So we'll look at these graphs and figures and talk about what they mean.

During the past 50 years, we really see that the overwhelming majority of people affected by disasters were affected by natural disasters. In addition, the percentage of homeless people during these past 50 years, overwhelmingly caused by natural disasters. As well as the percentage of damage cost, you can see again, almost all of that is blue, with only a small sliver of being technological disasters.

So once again, natural disasters cause the overwhelming majority of damages and cost for that. But now there's a little bit different in this last figure. We're looking at displacement rates of populations.

In other words, for every hundred thousand people that are affected by either disaster, how many of those people actually are displaced from their homes? And we can see here that technological disasters far exceed this element of displacement. So for every hundred thousand people, much more people are displaced by technological disasters as compared to natural disasters. So that's an important point to recognise.

So we also see in this particular figure that the overwhelming majority of the percentage of deaths caused by disasters during the past 50 years were caused by natural disasters. In addition, the percentage of injuries, almost the same as well. Natural disasters far exceeding technological disasters.

And the mean deaths per event, in other words, the average number of deaths per each disaster event, also very much higher for natural disasters compared to technological disasters. But now let's take a look once again at this rate for every hundred thousand people that were affected during the past 50 years. The overwhelming majority of those people, much more people were affected, were killed by technological disasters as compared to natural disasters.

So that makes sense that for every hundred thousand people, technological disasters affected and killed much more per hundred thousand people. So it's a much more dangerous

phenomenon when we're talking about technological disasters. So now let's look at that death-injury ratio.

What a death-injury ratio is, is the number of people killed in that disaster as compared to the number of people injured. And we can see in this particular figure that that rate is much higher for technological disasters as compared to natural disasters. And finally, the injury rate.

Injury rate is the number of people that were injured per hundred thousand people that were affected. And you can see that once again, technological disasters cause a very high injury rate when we're comparing that to that of natural disasters. So let's talk about disaster losses because people tend to use these two phrases interchangeably when they talk about consequences and impact.

And I want to separate those out for you. I'm a little bit of a stickler when we're talking about this terminology because I think if we use these words interchangeably, we sort of lose a little bit about the meaning. So disaster consequences or hazards, those are the negative effects on human or physical or mental and social well-being caused by disasters.

And you know, that's an important thing to recognise when we're talking about humans. It's one thing disaster losses that affect a street or highway or building and so on. Those things can be repaired.

And it's a mixture of bricks and mortar and concrete and wires and so on that cause this physical infrastructure. But we're looking at humans, we have to recognise that there's a physical, there's a mental, there's a social well-being. There is an aspect of that that makes people feel whole.

And I love the way that the World Health Organisation talks about health. They say that health is not just the absence of disease. It's a more holistic approach that includes your spiritual well-being.

It includes a wellness, a feeling that people are whole and they're safe. And that's one of the things we have to recognise that change when we're talking about the disaster consequences for humans. In addition, we can compare those consequences to disaster impact.

Impact is the measure of the severity of a disaster. So we are measuring the severity of these consequences, the number of people homeless, the number of people injured, the overall number of people that may be displaced from their home. So the impact is a measure or a metric of the severity of that particular disaster.

We also want to recognise that, you know, public services are also affected by disasters and many of these also have a cascading effect to cause more injury or illness or disruption down the line. So for example, when we talk about communication links, not only are roads and telephones and internet and so on all disrupted after a disaster, that happens for the victims but also for the responders themselves as well. It's much more difficult to mount an effective

response when we have the roads and the telephones and so on out of business.

And so we really have to think in terms of more carefully of a communication and making that more robust. Public utilities can also be disrupted. I mentioned before water supply, very critical issue when we're talking about disaster affected populations.

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And in addition, sewage disposal, trash pickup, all of those things, very, very key in the element of being able to maintain the whole element of services for a community rather than something that may be disruptive. So we all take for granted and you go out to take your trash out to the side of the road and trash pickup occurs and we take for granted the garbage is gone, we don't have to worry about it. But imagine now that being disrupted after the disaster and the trash builds up, no sewer, no water, a lot of these things are compounding and so they make the environment more and more dangerous as time goes by.

We also have a loss of public services and disasters that are related to energy. So people lose their gas supply or their electricity supply. And those are big issues when we're talking about temperate climates where it may be cold and people need to heat their home and people need to cook their food and so on.

And this loss of energy actually has a very, very difficult process of putting people through this issue of not being able to heat their homes. And so they may turn to ways that they're not normally accustomed to doing so to heat their home. For example, people may move heating elements like charcoal or other types of heaters indoors where it can give off carbon monoxide.

And not knowing that, that carbon monoxide builds up and it can actually poison people. And you can have deaths three, four, five days after the disaster from the carbon monoxide that people have inside their home because they don't have the electricity. Or they don't have the gas to heat their home and they may be doing so with trying to heat it in other ways.

The other thing that we see very commonly in many countries is the idea that people lose electricity and then they may use generators, for example, and they start that generator and it runs near the home or runs inside a closed space like inside of a shelter, inside of an awning or a garage. And that carbon monoxide builds up there and builds up inside the home. And they may not notice it at first or they may feel a little slight headache and so on.

But when people lie down and go to sleep, that may also continue to build up and get to toxic levels. And so this idea that electricity, loss of electricity, not just an inconvenience, but can many times be a hazard to your health that we have to address as well. Disasters also damage communities.

And so we can have a loss of industrial facilities or economic base in these particular communities. We have small and large businesses that can go out of business. You can have large effects like hospitals being knocked out and so on.

But we can have these smaller businesses also that are unable to operate. Doctors clinics, for example, missing a key person, missing water, missing electricity, can't open. People can't go to their businesses.

They can't start up. They can't show up to their job after a few days of trying to recover. They can't go out and make a living.

And so therefore, you have this primary disaster of the event itself and then now secondary economic problems as well that build upon that. We also see crop destruction in agriculture. And we've seen this in other prior places as well where people may be reliant upon one type of crop, like a rice crop or a corn crop.

And that particular crop fails because of this disaster. Those of you that may be familiar with the Irish potato famine, this was a good example of this crop failure really making a difference in that people were very dependent upon the potato. And when a problem with that potato and the agriculture, the crop was destroyed, we really saw then many, many people have a result in famine because of that.

In addition, we also see the health infrastructure of hospitals are destroyed. But not only hospitals, individual clinics, ambulance systems, many of the things that we take for granted as being the health infrastructure that's there, it becomes victims along with those people that may be injured and are killed from these events. So we have to think in terms of repairing the industrial facilities, the economic base, agriculture and also the health infrastructure to really make a difference to be able to treat that community as a whole.

So certainly everyone can recognise that there are disaster-related consequences that associate with mortality. So we always recognise that we're mortal. And that's the way I remember mortality is, I'm immortal so therefore I can die.

And death, death's of course very common in disasters. Those are one of the main things that we want to focus on. But you know, this is also something that we want to focus on here.

I want to focus on with you as well because, you know, I'm not here to rebuild your life after the disaster and that be it. Some things can't be rebuilt. When you lose a family member, you lose a father, a mother, brother, a sister, a child, grandparents, friends, family and so on, you know, we can't get that back.

So we have to think in terms of preventing those kinds of injuries. We really have to work together ahead of time to learn about these disasters and prevent ourselves from being the victims to begin with. Because we can't rebuild the human body like we'd rebuild a road or a building and so on.

We really want to protect ourselves ahead of time. And a little bit of forethought can go a long way in doing that. And the other aspect of public health consequences of disaster is this issue of morbidity.

In other words, the types of medical things or the types of medical problems that people look occur with people when we're talking about injuries and illnesses related to disasters. And one of the most common is the worsening of chronic illnesses. So people with diabetes, asthma, emphysema, heart disease, these are all chronic diseases.

And some countries, of course, the more developed countries have more of these among the population than others. But we see these diseases worsen after a disaster. So, for example, we see heart attacks increase.

We see strokes increase after heat waves. After the Olympic bombing in 1996 and the Olympic Games, there was a four deaths all from the bombing and a fifth death actually from a heart attack that a person suffers. We see this worsening of these existing chronic illnesses and we should be prepared to address that.

We should be prepared to be able to prevent those from happening when a disaster occurs. We also see this remarkable issue of psychological illness. I mentioned before the issue of, you know, feeling whole and feeling safe and having a social and a cultural and a psychological safety and comfort.

And, you know, many times that goes away after disaster. So people suffer from psychological illness, sometimes post-traumatic stress disorder, and other kinds of problems occur very much associated with these types of disasters no matter what particular category. We also see increased pests and vectors.

And so, for example, we see mosquitoes and increasing flies. We see sometimes increasing rats and so on after these disruptions of the environment and people's shelters more exposed to these particular elements. What we don't see, however, are very, very few examples where we have diseases that are worsened by this.

And not only are the pests and vectors in the environment disruptive, but we also see a disruption of even domesticated animals. For example, dogs. Dogs normally have a very well circumscribed territory.

And without going into too much detail, I can share with you, you know, they mark that territory from time to time. But when a disaster disrupts a dog's territory, it actually makes that dog feel as though that it's not at home either. It's on edge, it doesn't have a well-described area that it's responsible for, that it's its own home turf, so to speak.

And so we actually see dog bites increase after these types of disasters that change the environment. We also see, of course, severe injuries, and most people can recognise that as well. We see severe injuries after disasters.

But what we don't normally see in everyday life is a large number of severe injuries that all occur on the same moment, sometimes at the same hour. And so thousands of injuries all occurring at the same time, they create a special set of public health consequences that the

hospitals may become overwhelmed. We also see toxic exposures, for example.

We see poisonings that can occur, for example, when industrial facilities are disrupted or hazardous materials are spread and so on. So that can occur when we're talking about, you know, if you live next to a factory or another storage facility or a warehouse and so on. But we can also see these toxic exposures even from the chemicals that are underneath your sink.

You know, many of the cleansers and oven cleaners and all kinds of chemicals that we may use in our day-to-day cleaning of households and so on, those normally may be packed away very, very safely. But when we have a disaster and the home is disrupted, we may have those chemicals spilled. They may be spread around.

As we're doing cleanup or recovery, we may become exposed to those, and so we have to be concerned about those toxic exposures. We also have a certain element of food scarcity that can occur. Once again, not always the case, but it can occur.

And sometimes it's actually in the short term where we see people that, for a day or two, won't be able to get the adequate food. For most of us, that may not make as much of a difference. I could probably lose a few pounds myself with a few days and not be too harmed.

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But what about a baby, for example, that may need to be fed on a regular basis, baby nursing or bottled and so on? So this food scarcity issue does come into play even more so when we're talking about these vulnerable populations. And finally, we have this worsening of endemic diseases. So what do I mean by endemic? Endemic diseases are those diseases that are in existence in that community before the disaster occurs.

And so there may be a local disease, for example, there may be influenza, a flu outbreak in that particular community, and then when the disaster occurs, that worsens. Now the disaster doesn't bring in a new epidemic, doesn't bring in a new endemic disease, but what it does is it worsens what's already there. Now in the Western world, one of our endemic diseases are these things like chronic disease, where you have heart attacks and strokes and things like that that are much more common.

And those worsen, so we see those worsen after disaster. So there are also environmental consequences when we talk about the public health consequences of disasters. First off is there's this public concern for safety.

People want to feel safe in their environment, and that environment has been remarkably disrupted. So we really have to think in terms of people's element of people getting them back into their normal style of living, their normal routines, what they feel safe with. And that's a big, big issue when we're talking about different environments that have been remarkably changed by the disasters.

People, of course, as we mentioned before, that you lose hygiene, you lose clean water, you lose electricity, you lose shelter, you lose sanitation. All of these things are the environmental impacts of disasters. And all of those, as we talked about earlier, really have a cascade to increase your risk later on down the road.

A day, two days, a month after the disaster, you can really still be affected by the loss of these environmental issues and environmental triggers. We also have this disruption of the health infrastructure, as I mentioned. Not only hospitals, but also clinics, ambulances, health care, medical records, all the IT that goes into being able to provide good medical care, all of those things disrupted.

And so, therefore, we have this disruption of a health care infrastructure that we also have to bolster and strengthen. And finally, we have this loss of personal goods. And I have to share with you this story of, you know, myself as a green, wet behind-the-ears disaster responder years ago.

You know, much of my work early on was doing these needs assessment, rapid needs assessment, where I'd go to disaster-affected populations. I'd ask them what were their needs, what were their losses, and so on. And I'd ask them in particular, you know, food, water, shelter, all these things we've talked about.

And people would tell me, you know, what they need, and then I'd file that report, and other agencies like NGOs, United Nations, and their nation, and so on, would provide those goods for them. But I want to share with you a story of how I naively made a mistake of going to the wrong people and asking. So I went to this disaster-affected community, and I met with the village elders, which were all male.

And they told me, you know, one of the things we need are food. I asked them, so, you know, what kinds of food, and so on. And they gave me the specifics of the type of food that they were used to eating.

And so I put that in my report, and filed it, and I went back several days later to see if things were okay. And they said, you know, we still have a problem with this food. And what's wrong? Was it not delivered? No, it was delivered.

It was fine. But what we don't have are the pots, and pans, and the fuel to be able to cook it. And, you know, it was then I learned, of course, you know, I asked the men, who weren't involved in food preparation whatsoever, I asked them what their needs were, and they said, well, we need food because they're used to sitting down at the table and eating that food.

But who I didn't ask were the women that were involved in preparation of that food, and household goods that they needed, their own personal goods. And so here's a mistake that I made, that we really, as a hard lesson for me, that I want to share with you. You really have to think in terms of the loss of personal goods, and what people lose in their normal day-to-day

lives, that really have an effect on their environment, and the public health consequences and impacts.

So I know this is a busy slide, so I don't want you to be too scared away from it, but I kind of want to put it into perspective as far as colours. I colour-coded this particular figure so that I can share with you in a little bit better way. So I don't want you to get drug down to the details of how this is, you know, so detailed in many different disasters, but let's take a look at this far left column here when we're talking about the public health consequences.

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You can see that grey column are all the public health consequences that we just talked about. Deaths, injuries, loss of sanitation, water, loss of shelter, and so on. And you can see that across the board on these different columns going away from there are all the different disasters.

So at the top we have earthquakes, tsunamis, hurricanes, and so on and so forth. And what I want to point out to you is the bigger picture for this particular figure. What you can see is actually that each one of these particular disasters, no matter what the disaster, still have that same public health consequence.

So earthquakes and tsunamis and hurricanes and other types of disasters, floods for example, all of them cause deaths. Some of them more than others. And so what I've done is I've shaded for you in this particular figure the reds are the ones that are most severe, ambers are orange, those are the moderately severe, and then greens are the least severe.

So you can see that actually what really changes among disasters is not which particular public health consequences are affected but only the degree. So some have more deaths than others, some have less injuries than others, some have more displacement and loss of shelter than others, but all of them cause the same public health consequences. It's just a varying degree.

So what we should be thinking about is in terms of being able to accomplish all of those public health needs, fulfilling all those public health needs in the one grey column, if we're ready to do that we're ready for any of the disasters that can occur. And then we only need to change those according to the disaster by disaster. So this is the one that I have for in particular natural disasters and you can see you know quite a few variables but still all of them causing the same ones.

Now let's take a look at technological disasters. Same set of public health consequences and you can see here a variable colour set of colours as well. Some of them have a relatively moderate to high level of consequences, others relatively green.

So once again even technological disasters or man-made disasters cause nearly all those public health effects but only vary to the degree. So once again when we plan for the one grey column we're really planning for all these disasters. Now let's talk in terms of more detail about particular causes of deaths of disasters.

For example droughts are commonly associated with malnutrition and many people understand that link between drought and famine. But drought can also cause lack of water for sanitation and cleaning and so on. And so therefore we do see some infectious disease outbreaks when we're talking specifically about drought.

Once again not all of them. Wildfires are more commonly associated with suffocation or smoke inhalation rather than people actually being burned. So more people die from suffocation and smoke inhalation as compared to burns in these wildfires.

And so it helps us to understand that a little bit better. When we're talking about heat waves you know obviously most common heat illness but also heat waves cause worsening of the chronic diseases like heart attacks and strokes in particular. We also see other types of causes of death related to flood and tsunamis of course associated with drowning, storms, hurricanes.

The most common cause of death in a hurricane is actually drowning not the wind. People die from water not the wind. And so thinking in terms of what causes these particular aspects of mortality related to disasters we can then plan that a little bit better.

It's not always intuitive. Now of course earthquakes, landslides, tsunamis and so on. We know that the majority of those deaths occur from trauma from from you know people being struck by things of falling buildings and tsunami carried debris and so on.

But we also see suffocation occur. Now why does that happen? Ask yourself why would that occur in an example of an earthquake or a landslide? What it is is people become entrapped. So the building falls on them the landslide covers all them and it covers their chest and it prevents them from being able to draw a deep breath.

And when that happens that's when people suffocate. They're unable to be able to expand their chest and we see that from time to time as well. We also see cold weather and of course you can commonly you know expect to have people that have hypothermia which is low body temperature in the examples of these particular cold waves.

But we also see people that have carbon monoxide poisoning. As I mentioned earlier people that do inappropriate cooking, inappropriate fuel or heating inside their home that may give off carbon monoxide. And also now not only for natural disasters but we see specific causes of death for technological disasters or man-made disasters and many of these of course a little bit more intuitive.

So for example like chemical exposures or poisonings and so on we can expect you know poisoning to be a major cause of death in those. We also see for example explosions or fires and and those kinds of things we could expect of course trauma injuries and also specifically burns. Transportation crashes once again mechanical trauma.

We also see that as well with aspects of terrorism that may involve you know explosions and fires and those kinds of things as well.