



Module 4: Emergencies: Prevention, Preparedness, Response and Recovery

Part 1: Introduction and Prevention

Tamar: Hello, my name is Tamar Klaiman. I'm an Assistant Professor at the University of the Sciences in Philadelphia, and I'll be speaking with you about Healthy People 2020 with a focus on emergency preparedness, prevention, response and recovery.

The first module today will focus on the introduction and prevention of emergencies and disasters. The second module will focus on emergency preparedness at the individual state, local, and federal levels. The response module will focus on emergency responses from also the individual community and governmental levels, as well as disaster recovery, which will be the fourth module.

Let's get started today by focusing on introduction and prevention to emergencies.

Our learning objective for this module is to describe the history of emergencies and their influence on prevention activities.

Here, you'll see the Healthy People 2020 objectives that you should keep in mind while we go through the modules today. The first objective is to reduce the time necessary to get information about an emergency to the public; the second Healthy People 2020 objective focused on preparedness is to reduce the time necessary to activate response of personnel in a public health emergency; the third objective is to increase lab capacity during a public health emergency; and the fourth objective is to reduce the time for state public health agencies to conduct after action reports and develop plans following emergency responses to improve future responses.

Our outline today includes a discussion of the National Health Security Strategy, types and impacts of emergencies, as well as challenges to responding to different emergencies and how those challenges inform prevention.

To set the stage for what we'll be discussing, let's first just talk about definitions for both emergency preparedness and a health incident.

Emergency preparedness is defined by the Centers for Disease Control and Prevention as improving the nation's ability to prevent, prepare for, respond to, and recover from a major health incident.

A health incident is a wide range of natural and man-made phenomena that may have health consequences that include, but are not limited to, infectious disease outbreaks, hurricanes, earthquakes, storms, tornadoes, tsunamis, hazardous material spills, terrorist attacks, and fires. The definition of health incident comes from the Department of Health and Human Services of the United States government.



We'll discuss some specific examples of health incidents, and as we go through the modules, I want you to think about health incident examples that you may have experienced or that may have affected people in your community.

The purpose of the National Health Security Strategy is to focus disparate public health and medical preparedness response and recovery strategies and individuals in order to ensure that the United States is prepared for, protected from, and resilient in the face of health threats or other incidents with potentially negative health consequences.

The National Health Security Strategy was developed through the Pandemic and All Hazards Preparedness Act of 2006, and it requires that every four years, the Secretary of the Department of Health and Human Services submit a National Health Security Strategy to Congress. All policies, programs and budgets must align with National Health Security Strategy's strategic objectives. So you can think of this as the framework for all preparedness activities across the country.

The goals of the National Health Security Strategy include building community resilience and strengthening and sustaining health and emergency response systems. The focus of the National Health Security Strategy is preparedness at all levels, including personal, business and governmental, and we'll discuss each of these in turn.

Next, let's discuss types and impacts of emergencies.

You can think of emergencies in two different camps; the first being natural disasters, versus man-made disasters. On the left, you can see an example of a natural disaster such as a flood, and on the right, a man-made disaster, such as a nuclear explosion.

Although all disasters have psychological consequences, there are differences in the response to natural and man-made disasters.

Natural disasters are caused by an event out of human control. You may have heard them called acts of God. They generally result in significant community resilience where people across the community come together and help one another. Approximately 8% to 10% of people may develop PTSD, post-traumatic stress disorder, or other anxiety disorders after a natural disaster.

Examples of natural disasters include hurricanes, tornadoes, and the like. People are less likely to be referred for follow-up mental health care after a natural disaster because of the neighbor-helping-neighbor mentality.

Man-made disasters, on the other end, are examples of disasters caused by human intention. These might include chemical, biological, nuclear or radiological events. Often, neighbors are competing with neighbors for resources. This may include competing for food, water, shelter, et cetera.



CBNR events, particularly terrorism, will create more psychological problems than physical events. Man-made disasters create higher rates of post-traumatic stress disorder, depression, anxiety, and other disorders in the affected population, and can be as high as 45% of those affected.

Even non-CBNR events will create greater rates of psychological dysfunction because of the fear instilled in society. People are far more likely to be referred for mental health care after man-made disasters than after a natural disaster, particularly in the event of terrorism as the goal is to create fear even among those who have not been affected.

It's important to keep in mind that emerging infectious diseases and bioterrorism may look similar.

Some examples of signs of emerging infections and bioterrorism may be an outbreak of a rare disease; an outbreak of a disease where the disease is not endemic, so an outbreak, for example, of malaria in the Philadelphia region; diseases that are out of their natural season, so influenza, for example, in the middle of the summer; unusual age of those ill, so it may affect those who are particularly young and healthy as opposed to the very young and very old who usually are affected by emerging diseases; and unusual clinical presentation, especially respiratory symptoms.

Many of these examples may instill a great deal of fear among the public and may be thought of as either emerging infections or bioterrorism.

Some examples of naturally occurring outbreaks are listed here below, including Legionnaires disease in 1976, the plague in India in 1994, and West Nile virus in New York City in 1999.

Pandemic influenza may also be considered another likely disease outbreak. Such an outbreak would have extensive psychological results. You may think back to the 2009 H1N1 outbreak, which although not very severe initially, was quite scary for many people.

Some consequences from a mental health perspective of disease outbreaks and/or bioterrorism include high numbers of 'worried well', or people who believe that they may have been exposed to the illness and therefore have psychological [secolay 0:08:04] because of their possible exposure. There may also be limited medical interventions available. People may be competing with their neighbors, for example, for antibiotics or for vaccinations. There may also be fear of being exposed, and there may be a reduced response capability because of illness. So people who may normally be responsive, such as emergency physicians, nurses, or public health workers, may be unable to respond because of illness.

Next, I'd like to talk about some examples of specific emergencies and their impacts.

The September 11, 2001 terrorist attacks, which many of you may remember, included three coordinated attacks that affected New York City, Shanksville, Pennsylvania, and the Pentagon in



Washington, D.C. There were almost 3,000 deaths as a cause of these terrorist attacks, and the World Trade Center, a beacon of international trade and commerce, collapsed on September 11th of 2001.

This particular emergency was an example of a man-made disaster, and if you think back to some of the psychological consequences we just talked about, many of those arose in the wake of the World Trade Center collapse.

Hurricane Katrina in 2005 was an example of both a natural and man-made disaster. Often, we think of disasters as being one or the other, and in this case, there really was a dual disaster happening.

There were over 1,800 deaths during the hurricane and subsequent flooding, and \$81 billion in property damage. However, in addition to just there being a hurricane, the Army Corps of Engineers was deemed a failure because the levies that were supposed to hold the water back around New Orleans failed and the Army Corps of Engineers was blamed for the flooding that affected and killed many people. So this is an example of both a naturally occurring and man-made disaster.

In 2009, the pandemic H1N1 outbreak caused over 17,000 deaths worldwide. There were over 700 American school closures. In Mexico, the Cinco de Mayo celebration was cancelled. It led to the largest vaccination campaign in U.S. history, with over 61 million people vaccinated.

The 2009 H1N1 pandemic can be considered a natural disaster, but remember, many people also feared that it may be a bioterror event, at least in the early days until the strain of flu could be typed.

Now that we've talked about some types and impacts of emergencies, let's discuss some response challenges and how those challenges inform prevention for future emergencies.

There are a whole variety of challenges to a response in an emergency situation. The first challenge is care for those in need. Often, there is an immediate overwhelming of the nearest healthcare facility with lower priority patients, and those patients need to be able to be rerouted to other facilities as needed.

There also needs to be non-facility based triage. For example, in a train crash or a large car accident or a biochemical spill, people may need to be triaged in the field rather than at a particular medical site, and so that triage needs to be handled by emergency response workers.

Additionally, in terms of patient care, patients at local healthcare facilities may need to be discharged, and their discharge may need to be expedited if patients are non-critical, as well as a focus on protecting those patients who are already hospitalized and cannot be discharged.



All of those are key challenges in dealing with care for people who have been affected by an emergency.

Additionally, reallocation and an increase in hospital personnel and resources are an issue. Personnel may need to be reassigned to other areas of a hospital or be conducting triage in the field as opposed to being in their usual station.

Cooperation is another key challenge to emergency response. Response agencies have to be able to share information and share resources quickly. They also need to have joint, shared, or delegated decision-making and a clear decision-making process. It also requires mutual aid agreements among different jurisdictions or response agencies, as well as follow-through to ensure that decisions that are made are carried out.

In addition to care and cooperation challenges to a response, there are also transport challenges.

There may be limited transport surge capacity, so there may not be vehicles to get people who are affected to the resources that they need to be treated. There may be a requirement for alternative means of transportation for very serious events. There has been discussion in some communities about using school buses or local ambulances in the event of a serious event. However, the coordination among those transportation services has to be conducted in order to ensure that they are available.

Transportation away from overwhelmed facilities is just as important as transportation from the event site. It's not only a question of transporting patients from the impact site to healthcare facilities, but also transporting patients away from overwhelmed facilities to ensure that they can treat the people who are in need of treatment sooner rather than later.

Another transportation issue is the need to allocate patients appropriately between facilities. For example, if there is one facility that's treating level one patients and another that's treating level three patients, transporting patients from one area to another is a key transportation challenge.

The final major challenge to a response is situational awareness. The idea of situational awareness is that both facilities and responders need to receive accurate and timely information about what's actually happening in the field so that they can respond appropriately.

They also need to communicate information to one another and to the authorities. You may remember during the response to 9/11, the police and the fire fighters who were responding to the emergency were unable to communicate with one another, so they didn't know what was happening in different parts of the World Trade Center buildings. This continues to be a challenge. Situational awareness between responding agencies needs to be solidified prior to an emergency to ensure that they can communicate with one another during a response.



Now, let's talk about some examples of prevention that are actually going on.

The first example is the Army Corps of Engineers. The U.S. Army Corps of Engineers has approximately 37,000 dedicated civilian and soldiers delivering engineering services to customers in more than 130 countries worldwide. The U.S. Army Corps of Engineers builds and maintains American infrastructure and provides military facilities where service members train, work, and live. They also research and develop technology for those soldiers who are fighting wars. The Army Corps of Engineers is an often overlooked group that does quite a bit to ensure prevention for all kinds of various emergencies.

As we discussed during the Hurricane Katrina example, the Army Corps of Engineers was considered a failure because the levies did not hold, but there are a variety of political and economic reasons for those levies not holding. It's important to note that the Army Corps of Engineers does do a whole variety of activities to prevent the impact of various emergencies both in the U.S. and around the world.

Vaccination is another example of prevention. Currently, the U.S. Strategic National Stockpile includes various types of influenza vaccines, including an H5N1 vaccine. You may have heard of H5N1 as the next potentially emerging pandemic. This strategic national stockpile also holds millions of doses of other vaccines, antibodies, antiviral medications, and medical supplies. Should any of those vaccines directly relate to an emerging pandemic, they would be deployed to the population around the United States within 24 to 48 hours.

But it's likely that an emerging disease would require a new vaccine. In the case of an emerging influenza pandemic, existing vaccines would likely be ineffective against a radically new strain, in which case, developing and distributing a new pandemic vaccine would likely take at least four to six months, even while models demonstrate that pandemic influenza could spread globally within that time frame. So vaccination is a great way to prevent a variety of diseases, but in an emerging disease, it may be more challenging to get vaccination to the public in need.

Critical infrastructure is another example of prevention. Federal and local agencies around the country are assessing potential local threats and have created various plans to address them.

Plans include public education about evacuation, sheltering in place, and gathering supplies, some of which we'll talk about in the next module. These plans also include continuity of operations plans to ensure that essential services are maintained such as roads, electricity and other various infrastructure.

If you look back to this module, we have discussed the fact that previous emergencies have greatly enhanced our understanding of preparedness and response challenges, and we've talked about some specific emergencies and the response to those emergencies and how those have informed preparedness for future emergencies.



Public Health Learning Modules

Using **Healthy People 2020**
to Improve Population Health



ASSOCIATION FOR PREVENTION TEACHING AND RESEARCH

It's also important to remember that the National Health Security Strategy was developed and offers a framework to help both citizens and governments prepare for emergencies in a coordinated way. In the next module, we'll discuss some examples of preparedness that fall under the National Health Security Strategy.

Additionally, there are a variety of examples of prevention activities that can help mitigate the impact of an emergency, and we spoke about some specific examples of those.

Please stay tuned for the next four modules to learn more about emergency preparedness, response and recovery. I look forward to seeing you then.