

**POTENTIAL THREAT OF BIOTERRORISM RELATED TO SHIPPING  
IN THE MALACCA STRAIT**

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Slide 1 is the title slide.

To begin with, if I could have slide 2, I would like to bring us up to speed on some historical examples of natural disasters, weapons of mass destruction, and then bioterrorism. The only difference between natural disasters and bioterrorism is premeditation. So, if I can have slide 3 it shows some of the natural disasters that Mother Nature has brought about. If we look at the first one on the list, the Black Death, you will remember that this disease killed a quarter of Europe's population. The next disease, smallpox, occurred when Cortez went into Mexico and one of his people had smallpox. It devastated the Aztec nation. They lost 3.5 million people and resulted in the downfall of the Aztec nation. The cholera outbreak was a pandemic (a worldwide epidemic). It started in Southeast Asia and spread around the world. The measles outbreak was smaller and happened when the son of the king of the Fiji Islands went to Australia and contracted measles. When he returned to the Fiji Islands, a quarter of their population contracted the disease and died because these people were relatively isolated and as a consequence had never been exposed to measles and thus had no immunity to the disease. The same thing held true for the Aztec Indians because they had never been exposed to smallpox and thus had no immunity to it. Of course, the most devastating pandemic of all was the flu pandemic in 1918-1919. Over a third of the population of the entire world had the flu and it killed millions of people. India alone lost 20 million

people. The Irish potato famine did not cause disease in people, but half a million people starved to death and 1,500,000 people emigrated. As a matter of fact, that is the reason we got John F. Kennedy because the Fitzgerald's were one of the families that emigrated as a result of the famine. Then we had the hoof-and-mouth disease where 325,000 domestic animals were lost to the disease. More recently, in 1943 we had the Indian rice crop failure where 90% of the rice crop failed. So I think you can see that historically we have had a lot of problems with disease.

On the next slide (4) I'll give you some idea of the premeditated uses of disease as a weapon. During the crusades the Tartars would catapult dead bodies into walled cities. Not bodies of people that were killed but rather people that had died of a disease. The theory was that evil spirits had killed these people and if they catapulted the bodies into the city, then the evil spirits would get out and infect the people in the city. When Jeffery Amherst came to America, the British were having trouble with the Indians, so he gave them some blankets with smallpox on them. Over 2 million American Indians died of the smallpox. During World War I the Germans tried to use typhus against the Russians. Typhus, you may recall was one of the things that brought Napoleon down. Then in the Korean War, I worked in the biological warfare program and the North Koreans accused us of using biological warfare. What they accused us of was dropping spiders and I can assure you we were not growing spiders. In Afghanistan, if you remember, not too long ago we had the yellow rain situation. I don't recall if it was ever determined if the yellow rain was mycotoxin or merely bee pollen.

Now let's look at a couple of recent bioterrorism incidences. In the United States in 1984 (slide 5), a religious commune put disease organisms in salad bars in rural

Oregon and 751 people came down with intestinal disorders. Nobody died fortunately, but it made the people sick. In Japan (slide 6), if you recall the “Supreme Truth” cult used Sarin in the Tokyo subway system and killed 12 people. Prior to that incident, they had tried to disseminate botulinum toxin and anthrax spores into the atmosphere in Tokyo in the 1990’s.

The question arises as to what the potential is for bioterrorist attacks in the future? The next slide (7) shows that Al-Qaeda is trying to develop chemical and biological agents. The Russians and Iraqis cause a potential problem because they have a lot of people skilled in bioterrorism, and if they can’t make a living in their country, they may find employment elsewhere, in such places as Iran, North Korea, or Syria.

Here is another thing of considerable importance and that is what it costs to produce bioterror weapons (slide 8). If you are going to use chemical weapons to take care of a square kilometer area, it would cost you 600 times as much as it does if you use biological agents. If you are going to use nuclear weapons it’s going to cost you 800 times as much as biological weapons or if you are going to use conventional weapons, such as guns and explosives, it will cost you 2000 times as much.

Now let’s look at some of the diseases that are potential bioterrorism agents. As shown in slide (9) one of the most familiar agents is anthrax. It is not considered a contagious disease, *i.e.*, one that spreads from person to person, but it does affect people and there are basically three kinds of infections, depending upon where it gets into the body. One place is the skin, which is the most common, but this infection has a very low mortality. If you ingest the organism, there is about 25% mortality, while if you inhale it into the lungs, the mortality rate is almost 100%. Now here’s another important point.

There is a 5-day incubation period, which means that when you get the anthrax organism, it is going to take 5 days until the symptoms appear and then death usually follows because the symptoms are caused by the toxin that is produced, not by the organism itself. But here is the good news. There is now an antitoxin that will neutralize the toxin and if the antitoxin is given soon enough, the disease is no longer fatal. Therefore, if the antitoxin is available quick enough we can prevent the disease in most of the people. Antibiotics can then be administered to kill the organism and prevent more toxin being produced.

Plague (slide 10) is a highly contagious disease with an incubation period of 2-4 days. It can be spread through inhalation, but once again, if we respond quickly enough by getting an antibiotic to the exposed individuals prior to the development of symptoms, we can prevent the disease.

Another potential bioterrorism agent is cholera (slide 11). It is highly contagious and has an incubation period of 1-5 days. The portal of entry into the body is through the mouth but, once again, if we get antibiotics to the individual that has been exposed quickly, we can prevent the individual from getting the disease.

There are a lot of food borne diseases as shown in slide 12 that can be employed as bioterrorism agents. As may be seen in the slide, these are very common diseases, and a highly virulent strain could be employed to incapacitate the crew of a ship quickly.

Botulism (slide 13) is a disease caused by the ingestion of the botulinum toxin. It is the most toxic substance known to man. After ingestion, the symptoms begin to appear in 6-36 hours. A dose the size of one hundredth of an aspirin tablet could kill 50,000 people. The toxin is stable in uncooked food but is destroyed by heat (80°C for 10

minutes). There is an antitoxin available and if given early enough, the disease can be prevented.

Slide 14 shows how many organisms it takes to infect an individual. If you notice, cholera only takes 100 organisms to infect. The next slide (15) shows that as little as one milliliter of cholera cells could infect 10 million people, while one gram of botulinum toxin could kill 8 million people. The slide also points out that an individual could be infected when they board a ship but not show any of the symptoms of the disease at the time. On the left in slide 16 is one milliliter of fluid and if this was a suspension of cholera organisms, it would be enough to kill 10,000,000 people and the drop of fluid on the right (20 drops per milliliter) could kill 500,000 people. Slide 17 shows three piles of salt (1 gram, 0.01 gram, and 0.001 gram) that if the salt were botulinum toxin would be enough to kill 8,000,000, 80,000, and 8,000 people, respectively.

So much for the bad news, and now let me end my presentation with good news about ways to mitigate bioterrorist attacks.

First let me emphasize that it is impossible to prevent a bioterrorist attack on ships, but there are ways in which we can mitigate the damages of such an attack and prevent a catastrophe. First (slide 18) shows that we need to have effective communication, not only between ships and ports, but also have available trained medical personnel who can evaluate symptomatology of seamen on ships and give advice as to what to do until help arrives. They can also call for the immediate dispatch of testing equipment, antitoxins, antibiotics, etc.

The next slide (19) indicates that we need to have available at key location(s) in the area such things as testing devices to identify specific disease organisms and have available for immediate delivery necessary antitoxins, antibiotics, or other medical treatments. Many diseases can be prevented if antitoxins or antibiotics are administered in time. One such machine is shown in slide 20.

The third requirement (slide 21) to prevent a disaster is to have personnel available so that they can be transported rapidly to an effected ship should the entire crew be effected by a disease. Consideration also must be given to the safety of this replacement crew.

Finally, plans should be in place to decontaminate stricken ships (slide 22). Not only would it be worthwhile to have certain decontamination capabilities aboard ships but also more elaborate capabilities on shore ready for deployment. The next slide (23) shows individuals in protective apparel.

The last slide (24) sums up some of the ways of mitigating damages of a bioterrorist attack on ships in the Malacca Strait.