

UASI Scenario: The Christmas Shopping Trip From Hell

- **Date and time of incident:** Friday, November 23, 2007 (noon)
- **Agent:** Pneumonic plague, which is a disease caused by exposure to *Yersinia pestis* (*Y. pestis*), a bacterium found in rodents and their fleas; the pneumonic form can be transmitted from person to person; bubonic cannot. *Y. pestis* used in an aerosol attack can cause the pneumonic form; it's widely available in microbiology banks, thousands of scientists have worked with it. However, production of plague in a weaponized, aerosol form requires advanced knowledge and technology. U.S. intelligence agencies have identified Hezbollah, an Iran-sponsored terrorist unit, as having conducted research on the use of pneumonic and bubonic plague as a weapon of mass destruction.
- **Transport method:** Aerosol attack into HVAC system of a regional shopping center. Access to such systems typically would not represent a significant challenge for a small group of terrorists. Perimeter security, if present at all, is often limited to easily penetrated chain link fencing. The attack into an HVAC system would affect anyone present in the building attacked for up to the first hour after the release. (*Y. pestis* is easily destroyed by sunlight and drying. When released into air, the bacterium will survive for up to one hour, depending on conditions.)
- **Incident location:** A major regional shopping mall in Arlington, Texas (approximately halfway between the cities of Dallas and Fort Worth).
- **Location population at time of exposure:** 5,000 shoppers
- **Number exposed:** 3,200 (64%)
- **Time required for symptoms to emerge:** 24 hours or Saturday, 11-24-07 (noon)
- **Hospital visit pattern:**

| Hospital name | Location | # treated | % of total exposed |
|-----------------------------------|---------------------------|-----------|--------------------|
| Harris Methodist Hospital | Fort Worth (downtown) | 640 | 20% |
| Arlington Memorial Hospital | Arlington (central) | 480 | 15% |
| Baylor All Saints Medical Center | Fort Worth (downtown) | 480 | 15% |
| John Peter Smith (JPS) | Fort Worth (downtown) | 480 | 15% |
| Huguley Memorial Hospital | Burleson | 256 | 8% |
| Harris Methodist HEB | Bedford | 224 | 7% |
| Medical Center of Arlington | Arlington (south central) | 160 | 5% |
| Parkland Health & Hospital System | Dallas | 160 | 5% |
| XYZ / all other hospitals | Dallas-Fort Worth area | 160 | 5% |
| USMD of Arlington | Arlington (southwest) | 96 | 3% |
| Mansfield Methodist Hospital | Mansfield | 64 | 2% |
| Total | N.A. | 3,200 | 100% |

- Syndromic surveillance signal description:** Pneumonic plague primarily affects the lungs; the key syndrome category is respiratory. The initial wave of alerts would occur at 1 p.m., Saturday, 11-24-07 and would continue for about a week. Assuming half of the zip codes in Arlington and a quarter of those in Fort Worth would generate alerts in the first few hours, there would be 9 alerts from Arlington zip codes, and 15 from Fort Worth zip codes. Additional alerts would be expected from the Mansfield and Burleson zip codes, and from at least 5 of the more than 120 zip codes in Dallas. These zip code alerts, numbering more than 30, would also generate county alerts for Dallas and Tarrant counties as well as a region-wide alert.
- Pace of outbreak:** One to six days after becoming infected with the bacteria, people would develop pneumonic plague. Once people have the disease, the bacteria can spread to others who have close contact with them. Because of the delay between being exposed to the bacteria and becoming sick, people could travel over a large area before becoming contagious and possibly infecting others. Controlling the disease would then be more difficult.
- Public health investigation:** Local epidemiologists would be alerted via e-mail and called in for duty (despite it being a Saturday) because of the severity and frequency of the alert pattern. While it can be anticipated that there may be a high number of respiratory alerts near the Thanksgiving holiday due to seasonal flu, an outbreak of pneumonic plague from a bioterrorist attack such as that described in this scenario would cause a much “louder” syndromic surveillance signal over a relatively short period of time than the rise of flu season. That a disaster had emerged would be apparent within the first two hours of affected residents arriving at hospital EDs. Calls to Infection Control Practitioners (ICPs) at hospitals would start to seek clues as to the cause of the numerous respiratory alerts. In addition, use of the ESSENCE and BioSense system would allow epidemiologists to view hospital emergency department chief complaint data and look for patterns that would allow them to form theories regarding the cause of the outbreak. While some of the symptoms of pneumonic plague are also found in seasonal flu (e.g., cough, fever, nausea, and weakness), other symptoms associated with pneumonic plague would be markers of that unique cause (e.g., rapidly developing pneumonia, shortness of breath, chest pain, abdominal pain, vomiting, and sometimes bloody or watery sputum.)
- Outbreak confirmation:** As soon as pneumonic plague is suspected, healthcare or public health workers would order medical samples (blood, sputum, or lymph node aspirate) and send them to the North Texas Regional Laboratory at Tarrant County Public Health for testing. Once the lab received the samples, preliminary results would be ready in less than two hours (as early as late Saturday night, in this scenario). Confirmation would take longer, usually 24 to 48 hours (Monday morning, in this scenario). Lab specialists would refer to the pneumonic plague case definition and lab criteria available on the [CDC Website](#) to make their determination.
- Public health response:** Without early treatment, pneumonic plague usually leads to respiratory failure, shock, and rapid death. However, the spread can be readily controlled by standard public health response measures. Antibiotics should be given within 24 hours of the first symptoms. Several types are effective for curing and preventing the disease. Available oral medications are a tetracycline (e.g., doxycycline) or a fluoroquinolone (e.g., ciprofloxacin). For injection, streptomycin or gentamicin antibiotics are used. Early in the response to this bioterrorism attack, these drugs would be tested to determine which is most effective against the particular weapon that was used. National and state public health officials have large supplies of drugs needed in the event of a bioterrorism attack. These supplies would be available locally within 12 hours via activation of the Strategic National Stockpile (SNS).

- **Anticipated communications:** Given the strength of the syndromic surveillance signal pattern, it can be assumed that public health staff, led by the Health Authority, would quickly determine that an abnormal and potential dangerous community health problem had occurred and that prompt communication to the medical community, law enforcement agencies and first responders would be necessary. In the following presentation of simulated communications, the underlying assumptions are that:
 - Initial information would be followed by updates roughly every three hours during the escalation portion of the outbreak and continue roughly every six hours during the de-escalation until conditions returned to normal.
 - For the purposes of this scenario, the first three communications are shown in what is intended to be representative of their full form. Follow on communications would be expected, but samples for those are not necessary for understanding the scenario.
 - A tiered system of alerting will be employed in the LE/FR system as follows: A health alert (color = red) conveys the highest level of importance and describes immediate actions prescribed or attention sought from those receiving it. A health advisory (color = yellow) provides important information for a specific incident or situation, but may or may not require or prescribe actions. A health update (color = blue) would provide updates regarding a previously noted incident or situation; such information would be unlikely to require action either because actions have already been prescribed or are not warranted. Normal status (color = green) would be noted when health conditions are normal or have returned to normal following an incident or outbreak; no action would be prescribed.

Health Advisory
11-24-07 2 p.m.

Widespread Respiratory Problems Being Investigated

What's happening: Tarrant County Public Health and other local health departments are investigating a large number of health alerts, over a wide region encompassing Tarrant County, reflecting respiratory complaints. Software tools used by public health staff to monitor changes in community health patterns have revealed a significant spike in respiratory problems as reported in chief complaints recorded at hospital emergency departments.

What's it mean? Measures are being taken to rapidly assess the situation and to diagnose the exact organism or organisms that are responsible for this upswing in respiratory illnesses. Although there's often an upswing in respiratory diseases during flu season, this seems to be out of the ordinary and may represent an outbreak that will require special public health intervention. When the cause of these problems is more fully assessed, we'll issue a follow-on communication and suggest appropriate precautions or actions you should take, if necessary.

What actions should I take? Because this might be a significant problem and known symptoms are respiratory, we recommend the use of precautionary Personal Protective Equipment (PPE) in the form of an [N95 mask](#) (or better), particularly if you work in the vicinity of potentially contaminated material or approach anyone who is coughing, having difficulty breathing, or suffering from other respiratory symptoms. The Centers for Disease Control and Prevention (CDC) recommends an N95 mask, or N95 respirator, as lightweight, disposable respiratory protection from many viruses and bioterrorism agents when used properly (see [guidance](#)). (The "95" designation applies to filters certified greater than 95 percent effective in filtering out particles 0.3 microns or larger; the "N" is for use within an oil free environment.) This could be the beginning of a public health emergency, so we encourage you to watch this system for further updates and, if feasible, monitor the local media for news reports

What's next? We're working rapidly to determine the causes associated with this particular alert and we'll update you on our findings (as well as any recommended actions you should take, if applicable) within three hours.

What are the details now? We saw an unusually large number of respiratory alerts starting at 1 p.m. today (Saturday, November 24, 2007). Specifically, we received nine respiratory alerts from Arlington zip codes, and 15 from Fort Worth zip codes. Additional alerts were seen in the Mansfield and Burleson zip codes, and from five zip codes in Dallas. This large number of zip code alerts also resulted in alerts for Dallas and Tarrant counties and the entire North Central Texas region. We issued this health advisory because of the unusual number of similar alerts occurring over a wide region and over a short time interval.

Health Alert
11-24-07 5 p.m.

Investigation of Widespread Respiratory Problems Continues

What's happening: Tarrant County Public Health continues to investigate a large number of alerts, over a wide region of the Dallas-Fort Worth area, reflecting respiratory complaints. Starting at 1 p.m. today (Saturday, November 24, 2007), a significant spike in respiratory problems was observed in chief complaints recorded at hospital emergency departments. These problems now are escalating and more alerts are occurring. Preliminary investigation of symptoms suggests we may be seeing an outbreak of plague. Laboratory tests are being arranged to confirm this. Law enforcement agencies have been contacted to join in the investigation because this may be a result of terrorist activity.

What's it mean? If the cause of the respiratory problem is confirmed to be pneumonic plague, a public health emergency will be declared. Laboratory tests will reveal whether the plague is of the pneumonic form, which can be transmitted person to person; or bubonic, which isn't transmitted from person to person. Response measures will vary based on which form of plague is identified or whether another cause is determined for the respiratory alerts. You'll be instructed on appropriate measures to take.

What actions should I take? Because this problem could be pneumonic plague, a deadly, contagious disease, you must avoid close contact with individuals suffering from fever, nausea, weakness, rapidly developing pneumonia, shortness of breath, chest pain, abdominal pain, vomiting, and bloody or watery saliva. Before approaching someone with these symptoms, you must wear appropriate Personal Protective Equipment (PPE), such as an [N95 mask](#) (or better). The Centers for Disease Control and Prevention (CDC) recommends an N95 mask, or N95 respirator, as lightweight, disposable respiratory protection from many viruses and bioterrorism agents, including plague, when used properly (see [guidance](#)). (The "95" designation applies to filters certified greater than 95 percent effective in filtering out particles 0.3 microns or larger; the "N" is for use within an oil free environment.) If you don't have such a mask, use multiple layers of cloth as a face covering or seek help from others with masks. Ask the affected person to report to a hospital or primary care physician, or, if you have a mask, consider escorting them yourself. If you or others experience plague symptoms, contact the Tarrant County Health Authority at (817) 205-8402. Watch this system for updates and monitor local media.

What's next? We're waiting for the results of lab tests that were ordered; the findings will reveal whether the cause of the problem is plague, and, if so, which form of plague. We're also working to find the location of the source(s) of the widespread respiratory problems. We'll update you on the laboratory findings (and recommended actions you can take, if applicable) within three hours.

What are the details now? Respiratory complaints continue to escalate; an investigation is underway to determine whether plague is the cause. Hospital and public health workers have ordered medical samples from affected patients and sent those for testing to the North Texas Regional Laboratory at Tarrant County Public Health. Preliminary results are expected in the next several hours; confirmation of findings will take 24 to 48 hours. Plague information on the [CDC Website](#) will assist lab specialists

What's the history of this situation?

- Widespread respiratory problems were reported in a [health advisory \(11-24-07, 2 p.m.\)](#)

Health Update
11-24-07 8 p.m.

Pneumonic Plague Linked to Widespread Respiratory Problems

What's happening: Pneumonic plague is the probable cause of widespread reports of respiratory problems in the region. Preliminary results of tests conducted by the North Texas Regional Laboratory revealed known markers of organisms in medical samples from affected patients exposed to the bacterium that causes plague. The test results are subject to confirmation, but indicate an outbreak of the pneumonic form of plague, a deadly disease that can be transmitted from person to person.

What's it mean? Although this is a public health emergency, you should remain calm. By following the instructions below, you'll avoid being affected by this outbreak.

What actions should I take? To prevent severe illness or death, a person who has been exposed to pneumonic plague must get antibiotic treatment rapidly. If an exposed person gets ill, antibiotics must be administered within 24 hours of their first symptoms to reduce the risk of death.

If you think you've been exposed to plague or you encounter others who may have been exposed, seek immediate medical attention and notify the Tarrant County Health Authority at (817) 205-8402. Information on where to get medical care and antibiotics will be issued via this system soon, so follow those instructions.

If you haven't been exposed: Recognize that pneumonic plague is a deadly and contagious disease and you must avoid close contact with individuals suffering from known plague symptoms (see [list](#)). If you see someone with these symptoms, before approaching them, you must wear appropriate Personal Protective Equipment (PPE), such as a tight-fitting disposable [N95 mask](#) (or better). The Centers for Disease Control and Prevention (CDC) recommends an N95 mask, or N95 respirator, as lightweight, disposable respiratory protection from many viruses and bioterrorism agents, including plague, when used properly (see [guidance](#)). (The "95" designation applies to filters certified greater than 95 percent effective in filtering out particles 0.3 microns or larger; the "N" is for use within an oil free environment.) If you don't have such a mask, use multiple layers of cloth as a face covering or seek help from other responders with masks.

To identify victims, look for these symptoms: fever, nausea, weakness, rapidly developing pneumonia, shortness of breath, chest pain, abdominal pain, vomiting, and bloody or watery saliva. Put on your N95 mask before approaching victims. Contact the Tarrant County Health Authority at (817) 205-8402. Only if you have an N95 mask should you escort victim(s) to medical care centers.

To assist others, tell them to avoid contact with others who have plague symptoms and, if they encounter others with such symptoms, to put on an N95 mask (or better) before approaching them. They should also notify the Tarrant County Health Authority at (817) 205-8402, then ask the affected person to report to a hospital or primary care physician. Do not escort victims to medical care centers unless you have and wear an N95 mask.

Monitor this system and local media for further details.

What's next? Efforts to confirm the preliminary lab results are underway and will be completed in 24 to 48 hours. A press conference will be staged soon. Officials from the Texas Department of State Health Services (DSHS) and the Centers for Disease Control and Prevention (CDC) are now assisting Tarrant County Public Health with further investigation of the outbreak, including efforts to find the location of the source(s) of the plague. A variety of response and control measures have been launched. We'll update you on these and other efforts within three hours.

What are the details now? The CDC, Federal Bureau of Investigation (FBI) and other authorities are investigating this outbreak of pneumonic plague as a probable act of bioterrorism. Local supplies of antibiotics will be used to treat victims at network distribution centers now being established. Use of the Strategic National Stockpile (SNS) has been requested; this will ensure an adequate supply of antibiotics because items in the SNS will be available locally within 10 to 12 hours.

What's the history of this situation?

- A [health alert \(11-24-07, 5 p.m.\)](#) cited plague as a possible cause of area respiratory problems.
- Widespread respiratory problems were reported in a [health advisory \(11-24-07, 2 p.m.\)](#)