COUNTY OF LOS ANGELES
DEPARTMENT OF HEALTH SERVICES

Public Health

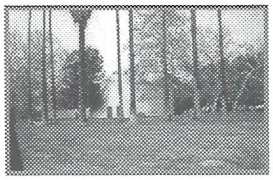
2ND LOS ANGELES COUNTY FORENSIC EPIDEMIOLOGY CONFERENCE

SCENARIO 1

SCENARIO 1

BACKGROUND INFORMATION:

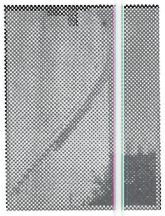
January 7, 2005



A group of eighth grade students from the Los Angeles Unified School District takes a field trip to the Whittier Narrows Nature Center in South El Monte to study migrating wildlife and visit the museum. The group of 50 students shares the park with approximately 100 other visitors, staff, and chaperones, placing the total park population at roughly 150. While at the park, chaperones are busy keeping children away from the ponds and lakes. All in all, the children enjoy the opportunity to get away from the classroom and get hands-on experience. At the end of the day, they return to the school to catch their buses and meet their parents.

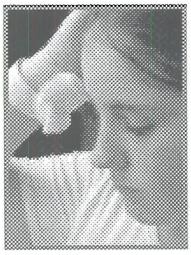
SITUATION UPDATE:

January 11 – 11:00 a.m.

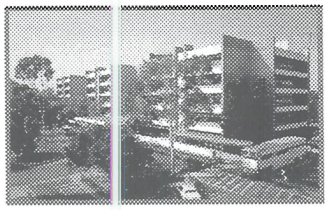


The Los Angeles County Metropolitan Water District, inspecting a local water tank that supplies the school, discovers that the fence surrounding the water tank has been breached, the heavy lock to the stairs has been cut, and the hatch on the tank appears to have been tampered with. The Los Angeles County Sheriff's Department is contacted. The incident is also reported to the Los Angeles County Department of Health Services (LA DHS) – Environmental Health, Los Angeles County Terrorist Early Warning (TEW) Group, and California Department of Health Services (CDHS), Drinking Water and Environmental Management, Field Operations Branch. Water District personnel are unsure if the water system has been compromised. Samples of the water are taken for testing for cyanide, pesticides, and gamma radiation. The tank is quarantined.

January 12 – 8:00 a.m.



A mother keeps her 14-year-old daughter home from school and brings her to the King/Drew Medical Center in Los Angeles. The child has been experiencing cramps and pain in her abdomen periodically for 3 days and recently began having diarrhea. The doctor asks if the child has traveled recently or been in any new environments.



The mother says that her daughter went on a school field trip the previous week and then flew to Portland, OR, for a family reunion. When asked about the field trip, the child says that she had a good time and learned a lot but remembers not having enough to drink in the park and standing in a long line at the drinking fountain back at the school.

January 13 – 3:00 p.m.

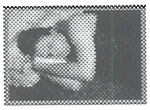
Laboratory analyses reveal that all of the water samples are negative. Officials are now waiting to hear the results of the radiological and pathogen screenings.

January 13 – 6:15 p.m.

A local man calls the Los Angeles Sheriff's Department to report a suspicious, unattended backpack in his backyard. He lives about a quarter mile from an area water tank. Items found in the backpack include unlabeled empty containers, wire cutters, and rubber gloves. There also appears to be a powdery substance at the bottom of the bag. Deputies take the items for laboratory analysis and fingerprinting.

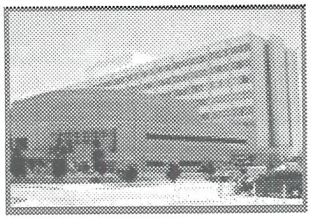
SITUATION UPDATE:

January 14 – 8:30 a.m.



The school administration notes a rise in calls from concerned parents. Many report that their children have diarrhea and are experiencing pain, nausea, vomiting, and high fever. Some parents were reluctant to call, but say they became concerned after talking to parents of their children's friends, who have similar illnesses. The attendance office notes that a large group of eighth graders are absent.

January 16 – 1:30 p.m.

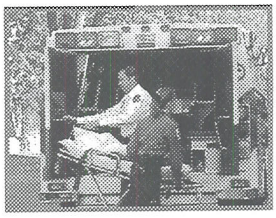


A 36-year-old pregnant woman and her 13-year-old son arrive at the Harbor/University of California at Los Angeles (UCLA) Medical Center complaining of intense headaches, abdominal pain, and diarrhea. Both report the pain has grown steadily worse since Saturday, January 14. Tests show they are both dehydrated, and the doctor gives them intravenous (IV) fluids. He collects stool samples to be tested at the CDHS Laboratory.

January 18 – 9:00 a.m.

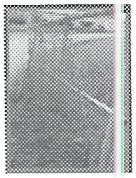
The school notices an increasing number of absent students. Some return healthy, while others return for one day and then are absent again. When final attendance counts reveal a 32 percent absentee rate on January 18, school officials confirm their suspicions of abnormal activity and contact the LA DHS – Public Health.

January 18 – 11:15 a.m.



A 12-year-old girl from the same school and field trip is brought by ambulance to Harbor/UCLA Medical Center with severe dehydration and diarrhea. She reports becoming sick over a week ago, and her patient history reveals that she is immunocompromised. Blood, urine, and stool samples are collected from the girl for testing. Throughout the day, her condition continues to worsen, and she passes away during the night. The attending doctor sends the samples collected from the girl to the CDHS Laboratory for further testing.

January 19 – 10:30 a.m.



The Los Angeles County Sheriff's Department receives reports that the security fences surrounding two additional water tanks have also been breached. The security locks on both have been cut, and the tops to both tanks have been forced open. No additional evidence has been left at either scene. The agencies who responded on January 11 are contacted once again to help investigate. Divers are requested to do a visual inspection, and both tanks are quarantined. Officials question whether these incidents are acts of terrorism. Water samples are taken for analysis and extra precautions are taken to ensure there are no contaminants in the water.

SITUATION UPDATE:

January 19 – 11:15 a.m.

A 51-year-old man brings his 13-year-old son to his private physician. The boy is complaining of severe stomach cramps and has a temperature of 102.1 °F. The doctor asks the father if he has any symptoms and discovers that the man vomited earlier in the morning. The boy has a history of asthma, and the father is currently undergoing cancer treatment.

January 19 – 1:30 p.m.

After collecting numerous blood and stool samples, the physician diagnoses the pregnant mother and her son with cryptosporidiosis. The doctor instructs the pair to rest and drink copious amounts of fluids. After noticing in the various patients' histories that all the children attended the same school, the doctor specifically orders cryptosporidiosis testing for the samples collected from the deceased 12-year-old girl. He also contacts the LA DHS – Acute Communicable Disease Control to report his diagnosis.

January 19 – 2:15 p.m.

The LA DHS – Public Health initiates conference calls with area hospitals. Doctors are made aware of the situation and stay especially alert for pre-teens and teens and their families with gastrointestinal (GI) symptoms. The LA DHS – Public Health also contacts the Centers for Disease Control and Prevention (CDC) regarding the diagnoses of cryptosporidiosis. A total of 38 stool samples are collected and sent to the CDHS laboratory with specific requests for cryptosporidiosis testing. Upon interviewing patients, epidemiologists determine the recreational water at Whittier Narrows Nature Center is the likely source of the disease.

Questions for Discussion

Public Safety

1. What actions should be taken immediately after discovering forced entry into the security fence surrounding the water tank? What specific interagency coordination is necessary at this point?
2. How will epidemiologists coordinate with law enforcement personnel in an outbreak investigation?
3. What other law enforcement agencies (if any) would you be contacting and coordinating with?
4. What indicators (e.g., increased Emergency Medical Services [EMS] calls) serve as clues to an evolving emergency?
5. What safety precautions would your resources take? What specifically would you advise them to do? How should evidence be collected if a chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE) agent is suspected?
6. What is the role of fire, EMS, and law enforcement personnel during a public health emergency? Who are the principal players? Which agency(ies) will lead the response effort?
7. Is there a mechanism for updating plans, policies, and procedures as a result of this incident? Who is responsible for coordinating these changes?

Public Health

1. Are there any surveillance measures currently in place to detect and monitor a potentially significant number of patients presenting with similar symptoms throughout the Los Angeles area?
2. What resources and/or resource-tracking capabilities do county or city agencies have for chemical or biological supply inventories (e.g., pharmaceuticals and equipment)?
3. What provisions exist for collecting data on new cases from private practice physicians and neighborhood clinics? How is information gathered from State, regional, local, and out-of-State sources, including diagnostic laboratories? How will this information be shared with the medical community?
4. Given the scope and nature of this public health situation, how is medical information shared, and how will regional medical response strategies be coordinated?
5. What actions would be taken to manage an increase in cases and/or prepare for future cases?
6. Are medical facilities adequate to handle biological-agent mass casualties? What provisions must be made to accomplish the task?
7. How would patients be tracked?
8. What is the established method of health surveillance? Which agencies will be involved in this effort? What person/agency is responsible for collating data and dictating public health intervention? What provisions exist for collecting data on new cases from private practice physicians, clinics, and 9-1-1?

9. Where would reconstitution of supplies or medications come from? How soon could you get them? What resource would you use to coordinate this effort?
10. How feasible and/or necessary is decontamination of the areas, facilities, and equipment? Who determines what level of decontamination is acceptable? What short-term and long-term problems do site contamination pose? What technical resources would be required to address this? Where would they come from?
11. The scale of this incident has yet to be defined. What actions would be taken to manage the increase of cases and/or prepare for further cases?

LABORATORY

1. Do your laboratories (e.g., State, local, commercial) have the trained staff, equipment, and reagents to identify suspected biological agents? If not, where would you seek assistance? Who is responsible for coordinating information?
2. What specific laboratory tests will be ordered for the water tanks after discovering forced entry? When will you expect to have the results back?
3. What specific laboratory tests will be ordered for the items or substances found in the abandoned backpack? When will you expect to have the results back?
4. What specific tests would be given to persons appearing with the symptoms described in the scenario?
5. What are the notification procedures following the identification of the scenario's causative agent? Who is notified?
6. Is there a time lag between the appearance of new cases and the reporting of information to State and local health authorities? If so, what problems does this present?

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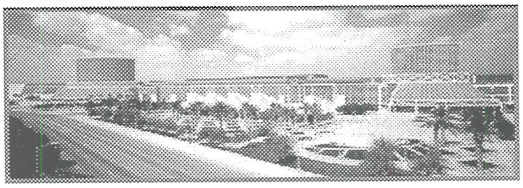
SCENARIO 2

SCENARIO 2

BACKGROUND INFORMATION:

January 29, 2005



Crowds of enthusiasts flock to the Los Angeles Convention Center to attend the opening of the Los Angeles Boat Show, scheduled to run through February 6, 2005. Window shoppers and serious boaters wander through the main foyer of the convention center and observe the latest in recreational boating technology. As additional incentives for attendance, balloons are given to the kids and hotdogs are available for everyone.

January 29 – 2:00 p.m.

The boat show has been under way for 4 hours, and there has been a steady stream of traffic. Organizers are ready to consider the first day a success. Estimated attendance has been approximately 12,000 to 13,000 people, and many people have purchased new boats or equipment.

SITUATION UPDATE:

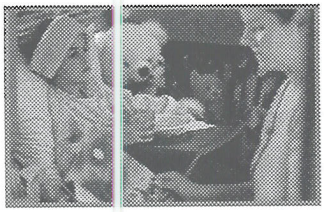
January 29 – 2:30 p.m.

The office of California Governor Arnold Schwarzenegger calls the Los Angeles Boat Show to inquire about events and security. The governor planned on attending the show this afternoon, but because of an unexpected meeting he will attend the show on Sunday instead. The boat show security team holds a meeting to discuss how to accommodate the governor's change in plans.

January 29 – 10:00 p.m.

A 52-year-old man enters Cedars-Sinai Medical Center, complaining of a high fever, headache, nausea, and deep chest pain. The man, who has no significant medical history, indicates that he felt sick earlier this evening. He tells the attending physician that he did not participate in any unusual activities, nor did he come into contact with an individual suffering from the flu. The attending physician orders a series of tests and cultures to be performed on clinical samples (blood and throat) obtained from the patient.

January 29 – 11:00 p.m.



At St. Vincent's Hospital, a doctor has just come on duty and sees her first patient, a 9-year-old girl. The patient's mother says her daughter has been complaining of an intense cough and nausea. Over the past few hours, the young girl has had difficulty breathing. The mother says her daughter has a history of severe and persistent asthma. The doctor inquires about events preceding the patient's illness and learns that, other than spending the day downtown with her family, there was nothing in the child's recent history to account for her sudden illness. The patient's mother believes she must have caught a bug from one of her friends at school. Three other young patients with similar signs and symptoms have also presented to St. Vincent's Hospital over the past hour.

January 29 – 11:30 p.m.

A 73-year-old female patient comes to St. Vincent's Hospital, complaining of chest tightness, fever, and intense nausea. A clinician records the following symptoms: generalized aches and pains, nausea, a temperature of 104 °F, and difficulty breathing. Including this patient, who is subsequently admitted, the emergency department (ED) physician notes that she has seen five cases with severe flu-like symptoms since the beginning of her shift at 10:00 p.m.

January 29 – 11:45 p.m.

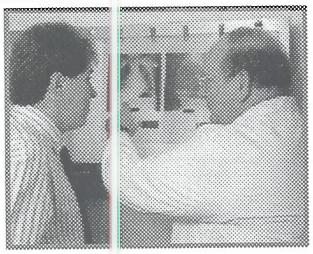
Since early evening, 300 patients (220 self-referrals and 80 Emergency Medical Services [EMS] transports) have reported to seven area hospitals, as well as clinics and private physicians throughout the city, with high fever, nausea, and difficulty breathing. These cases represent a dramatic increase in the number of patients typically seen for influenza-related illnesses at this time of year. The majority of these new cases that are presenting with signs and symptoms more serious than the common flu include a few otherwise healthy adults among the children and senior citizens.

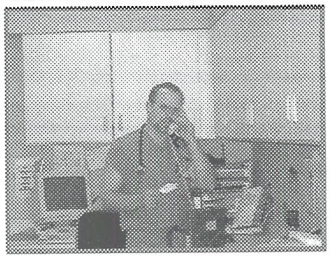
SITUATION UPDATE:

January 30 – 8:00 a.m.

In the last few hours, an additional 180 patients have either been transported by EMS or self-referred to hospitals in Los Angeles. Los Angeles Fire Department (LAFD) and EMS notify the County of Los Angeles Department of Health Services (LA DHS) – Public Health of the increase in runs throughout the city, the majority of calls for patients presenting flu-like symptoms. The LA DHS – Public Health epidemiologists convene to mount an intensive epidemiological investigation to determine the source of the outbreak.

January 30 – 9:00 a.m.





Many of the new patients do not seem to be responding to therapy with decongestants, analgesics, intravenous antibiotics, or antiviral medications. Chest x-rays indicate acute pulmonary edema in all of the patients, as their lungs fill with fluid at an alarmingly rapid rate. In an attempt to combat the severe alveolar flooding, emergency physicians place the patients on pure oxygen. Rapid viral culture tests for influenza will provide results within 24 hours, but full viral cultures will be sent to the public health laboratory, requiring 3 to 7 days for analysis. The lack of response to the initial diagnostic treatment regimen and the number of affected patients prompt several frustrated and seriously concerned physicians to seek advice and consultation from the LA DHS – Public Health. Although influenza is still considered a potential diagnosis, dialogue between some physicians and public health officials also explore other possible causes, including the potential for a foodborne or airborne disease outbreak. Many of the patients in admission continue to suffer from high fever (103 °F to 106 °F), nausea, severe breathing difficulties, and painful tightness in the chest.

January 30 – 10:00 a.m.

An additional 90 victims have been transported to area hospitals within the past 2 hours, all with the same symptoms as seen in previous patients. EMS indicates that it is experiencing difficulty transporting patients to various hospitals throughout the city. Many patients brought in earlier in the morning are having more difficulty with breathing. Worried that these patients might experience complete respiratory collapse, physicians consider mechanical ventilation to maintain oxygenation. However, this process requires constant attention, and many hospitals are having trouble finding enough staff for all the patients. Two patients have died as a result of respiratory complications.

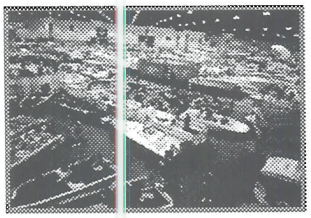
January 30 – 10:45 a.m.

An anonymous caller contacts the Los Angeles Convention Center and says that a bomb has been planted in the building. Security is immediately notified, followed by the Los Angeles Police

Department (LAPD). The decision is made to evacuate the convention center until the threat is investigated.

SITUATION UPDATE:

January 30 – 12:00 noon



Based on patient interviews, epidemiologists focus on the Los Angeles Convention Center as the suspect source of the unidentified disease outbreak. Scores of patients reported attending the boat show on Saturday afternoon. Although patients are asked whether they ate any suspect food items at the event, the lack of pronounced gastrointestinal (GI) symptoms in most, if not all, the patients continues to concern local medical and public health personnel. LA DHS – Public Health contacts the California Department of Health Services (CDHS) and the Centers for Disease Control and Prevention (CDC) to report the outbreak.

January 30 – 3:30 p.m.

After intense discussions with State and local public health and medical officials, officials with the CDC now strongly suspect a toxin-based disease outbreak. Because the overwhelming majority of patients presented within a 10-hour time frame and preliminary epidemiological investigations show a lack of common food ingested, this data also suggests a possible aerosol exposure to a toxin. These conclusions are strengthened by the absence of clinical signs and symptoms associated with traditional toxin-based foodborne outbreaks, which include intense abdominal pain and other upper GI complications. Moreover, test results collected to date do not indicate the presence of a bacterial or viral infection. Botulism poisoning is ruled out because of the lack of classic symptoms associated with the disease. As a result, one of the agents now suspected is ricin toxin, an easily-produced derivative of *Ricinus communis,* commonly known as the castor bean.

January 30 – 4:30 p.m.

A total of 13 patients suspected to have ricin poisoning have been reported dead since yesterday evening. Hundreds of others are ill or in critical condition. Area hospitals continue to receive a high number of actual influenza patients, making EDs crowded and diagnoses more difficult. Hospital intensive care units (ICUs) are overwhelmed.

January 30 – 5:00 p.m.

Federal, State, and local public health officials advise State and city officials that, based on the following indicators, the disease outbreak in Los Angeles is strongly suggestive of a deliberate chemical and/or biological (CB) attack:

- An explosive onset of symptoms in a large cluster of individuals suggests a large single source exposure.
- An unusually high prevalence of respiratory involvement in patients who have no history of respiratory difficulties indicates a possible aerosol exposure.

- A large number of patients presenting with fever, cough, and pulmonary edema within a few hours of one another indicates ricin as the toxin. Very rarely is exposure to this agent not deliberate.
- Testing of the heating, ventilation, and air conditioning (HVAC) systems at the Los Angeles Convention Center confirms ricin as the causative toxin.

Questions for Discussion

Public Safety

1. What are the immediate public safety priorities?

2. What training has been conducted for epidemiologists and criminal investigators on evidence collection procedures?

3. Who will conduct the bioterrorism investigation? How will this be conducted? How will medical and law enforcement investigations be coordinated?

4. What refresher training would be implemented for your personnel? Is the current level of weapons of mass destruction (WMD)/terrorist training adequate? What personal protective equipment (PPE) is available for first responder use based on the possibility of a WMD attack?

5. What are the notification procedures following the identification of the causative agent? Who is notified?

6. How is the response to this situation being coordinated? Is the city's leadership informed? What information would be communicated from the city to the Federal and State governments regarding the situation?

7. Based on the severity of the situation, what assistance would you request from the Federal and State governments? Is this assistance documented in your current response plans and procedures?

8. How will you respond to additional 9-1-1 requests for assistance, especially from those who claim to have flu-like symptoms?

9. Considering the agent was aerosolized, how will law enforcement deal with the victims' clothing, both as a precautionary measure and as a means of collecting evidence?

10. What specific information should be passed at this time, given probable discovery of the causative agent and the possible source? Who has overall authority for releasing information? What information should be released at this point? Why? What information, if any, should be withheld?

11. How do you expect the people of Los Angeles to respond to this type of attack? What actions do you want the public to take? What sort of inquiries would you expect to receive from the public and the media at this point in the crisis?

12. What measures might you implement to prepare and protect responders from possible future attacks?

PUBLIC HEALTH

1. What measures will be implemented to identify the source of the release and extent of contamination? How will you and your public health counterparts at the Federal, State, and local levels organize available resources to control the outbreak? Does your staff have access to authoritative guidelines and other information regarding treatment and implementation of control measures?

2. Do you have the staffing and resources to conduct extensive field investigations and victim interviews, as well as data analysis and other department-based tasks, for an extended duration?

3. What are the notification procedures following the identification of the causative agent presented in this scenario? Is there a system in place to ensure complete notification to the medical support structure?

4. Is there a method to evaluate or assess the scope of the problem (i.e., the extent of contamination and spread of the disease)? If so, how? How long will this take? Who can help?

5. Can victims of the attack be readily identified, or must treatment be started for the entire populace? How will notifications be made for possible victims who have left the Los Angeles County area?

6. Would you recommend quarantine? Why or why not?

7. Are clinical and environmental samples evidence? How will they be handled? How will you coordinate with law enforcement counterparts?

8. What procedures will be followed to identify and retrace the large number of victims?

9. What surveillance data is collected from hospitals, private physicians, and clinics? Who is responsible for collecting, organizing, reviewing, and disseminating surveillance data? Will this information be shared with the medical, public health, and emergency management communities?

10. What is your agency's process for identifying and documenting lessons learned? How will you update current plans and policies based upon this information? What measures will you recommend to mitigate future WMD terrorist incidents?

11. What activities will you undertake to restore preincident capabilities? What procedures do you have to address rehabilitating and/or replacing staff? How will equipment decontamination be accomplished? How do you expect supplies to be replenished?

12. What litigation will you expect from victims and their families? What mechanism is in place to address these issues?

13. Where will human remains be safely handled and disposed of? What precautions are required when conducting autopsies or handling remains?

LABORATORY

1. What specific tests would be given to persons appearing with the symptoms described in the scenario?

2. What specific laboratory tests will be ordered for investigating the scene? When will you expect to have the results back?

3. Given the signs and symptoms associated with the outbreak presented, what should be the immediate course of action? How will these steps be accomplished?

4. What precautions should be taken to protect your staff or medical responders? What measures will you recommend for isolation or quarantine of patients based on preliminary information (i.e., no confirmed diagnosis)?

5. What are the notification procedures following the identification of the causative agent presented in this scenario? Who is notified?

6. What are the requirements/guidelines for reporting cases in addition to specific reportable diagnosed diseases (e.g., clusters of respiratory or GI symptoms)? How are these enforced?

7. What information will your agency expect to receive from emergency management and response organizations regarding the situation? From which agencies will you pursue data?

8. What procedures are in place for logging, storing, packaging, and shipping samples of potentially infectious agents? How are these issues addressed for off-hours and weekends?