

Souvenirs: Investigating a Disease Outbreak

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Video XII: Microbes and Human Diseases

Souvenirs creates a problem space involving disease, multiple characters, and the realistic situations they face. As you attempt to untangle the skein of information in this scenario, you will have the opportunity to gain a practical level of understanding for the science needed to solve the problem. In addition to the microbiological investigation, there are threads involving social, economic and political impacts of disease on a community.

Getting Started

Choose someone in your group to read the first part of *Souvenirs* out loud. What do you think the case is about? Work with your group to answer the first set of questions. Feel free to use the resources available in the lab including your textbook and access to the internet. (The last three parts of the case are on the CD and will be assigned independently.)

Part 1. It All Started Here

It had been a wonderful week and a terrific break from the hum-drum life-style of the Chicago suburbs. The three women, all best friends from their college days, had planned for over a year to go on this archaeological dig sponsored as a fund raiser by their alma mater. Hilary, an elementary school teacher who suffered from asthma, was a bit concerned about working at such a high altitude. Ruth, a pharmaceutical chemist, was relieved to get away from her non-responsive colonies of laboratory mice. For Susan, this was just a bit of much needed R and R from her hectic life as a commodities broker. Although the dig had dried to dust, the participants stopped often to admire the yellow, pink and blue flowers covering the nearby hillsides.

The pot shards they had collected, carefully numbered and boxed, were now ready to be sent on to the museum. The friends placed the boxes, along with the plant material collected by the ethnobotanist, in the old storage shed at the site. Then they took the jeep for the one hour drive down the mountain to Santa Fe, where they spent their last afternoon in the Southwest shopping for jewelry and rugs. Because they had skipped lunch, they bought some fruit from a corner grocer. He explained in halting English that his family had just moved to Santa Fe from Argentina to start a new life. The fruit looked and tasted wonderful, though the old man coughed terribly as he waited on them. "I hope that's not catching!" Ruth thought to herself. Then she noticed a half-empty pack of cigarettes near the cash register and forgot the incident.



Figure 1: The kiva, a round chamber built underground with entry by a ladder, is a unique archaeological feature found in the southwestern United States.

The next morning was hectic, with last minute packing and loading the truck. As a favor to the site-manager, Hilary and Ruth also cleaned the storage shed. It was apparent that the shed was home to many rodents and had not been cleaned for many months. Hilary and Ruth did the best they could in the time they had. Both hoped someone else would complete the cleaning before the next group arrived to work at the site.

The flight back to O'Hare was smooth, but crowded. Susan and Ruth sat together, but Hilary sat in the back so she could stretch out a bit. Although the leg room was nice, it was annoying to sit right under the cabin air vent and in such close proximity to the bathrooms. Hilary cleared her throat.

Now ask someone else to read the second part.

Part 2. Home Sick

Sunday in Chicago for the three women was uneventful. They spent their time collecting the mail from the neighbor kid and catching up on laundry and bills before going back to work the next morning. Hilary had bought a beautiful hand-woven Navajo rug, which she shook out and displayed to family and friends.

Hilary began to feel ill late Sunday afternoon, with a fever, chills, and a dry cough. Since a cough was often a prelude to a long bout of asthma, Hilary used the nebulizer to insure a good dose of anti-inflammatory and bronchial dilating medications. She was also very thirsty. "It must be the result of my dry week in the Southwest and the canned airplane air," she thought to herself.

The next morning, feeling somewhat better, Hilary went off to work. It would be good to see "her" third grade kids after their spring break. However, by first recess Hilary was gasping for air. She was taken to the hospital and a substitute teacher took her place while the kids were out on the playground. Hilary was pronounced dead at 7:28 Monday evening. Cause of death was listed as respiratory failure due to asthma.

Susan, whose morning always started with obituaries and coffee, screamed as she read Tuesday's paper. She immediately called Ruth. The phone rang 6 times. "Hello?" croaked Ruth.

"Ruth, have you seen the paper? Hilary died last night!" Susan sounded breathless, as if she had been running.

"Hilary...but we just saw her Saturday and she was feeling fine!" answered Ruth.

"You don't sound so great yourself... Are you O.K.?" asked Susan.

"Yeah, I just caught a cold on that flight from Albuquerque. When's the funeral? I can't believe this is happening."

- Identify phrases having to do with any respiratory disorders found in the characters in the case?
- What are some possible non-microbial causes of the respiratory disorders?
- What kinds of microorganisms can cause respiratory disease?
- Identify sources of microbes that could be implicated in a respiratory problem for these characters.

Now that you have gathered some preliminary information, continue with “Part 3: What Hit Us?” on the *Microbes Count!* CD.

Optional Individual Activity

In the situation below, you asked to make a decision that requires you to consider biological information that you may not be familiar with. Read the scenario and gather facts. You will then be asked to make and defend your personal decision.

The Job Dilemma

You're an Anthropology major with a minor in Museum Studies. You've hoped to work in the US with Native American and early Spanish artifacts in the Southwest, but the field is tight for college grads in this area- most of the other people competing for jobs have at least a master's degree.

You've been offered the job of your dreams at a small museum and archeological site in southwest Colorado. The museum is old and musty, but you will be working on cleaning it up and rearranging the displays. Some on site digging for artifacts is planned as well. The museum director has warned you that the museum is in the middle of the area where deer mice are frequently found and that for much of the reorganization work in the museum, you'll be required to wear a respirator and oxygen tanks.

Should you accept? You need to make a decision.

- Make a list of at least 10 facts that will guide your decision. For each fact, be sure to specify the source, e.g. a book like “The Coming Plague” (Garrett 1994), a website like CDC (<http://www.cdc.gov/ncidod/dvrd/revb/respiratory/eadfeat.htm>), etc.
- Will you go? Explain.

Additional Resources

Available on the *Microbes Count!* CD

Text

A PDF copy of this activity, formatted for printing

Souvenirs Part 3: What Hit Us?

Souvenirs Part 4: Of Mice and Men

Souvenirs Part 5: Loose Ends and Law Suits

Medical data for Hilary, Ruth, Grocer, and Site Manager

Related *Microbes Count!* Activities

Chapter 5: The Farmer and the Gene: A Case Approach to Bt Corn

Chapter 10: Measles in the Nakivale Refugee Camp: Epidemiology in Action

Chapter 11: Identifying Immune Responses

Unseen Life on Earth Telecourse

Coordinates with Video XII: Microbes and Human Disease

Relevant Textbook Keywords

Asthma, Infection, Respiratory

Related Web Sites (accessed on 4/20/03)

Microbes Count! Website

<http://bioquest.org/microbescount>

Respiratory System: Diseases.

<http://home.cc.umanitoba.ca/~eworobe/122lecture15.pdf>

http://oac.med.jhmi.edu/res_phys/DiseaseStates/index.html

<http://www.cdc.gov/ncidod/dvrd/revb/respiratory/eadfeat.htm>

Respiration System

<http://science.nhmccd.edu/biol/ap2.html#respir>

Unseen Life on Earth: A Telecourse

http://www.microbeworld.org/html/mam/is_telecourse.htm

References

Fass, M. (2002) *The Job Dilemma*. (Private Communication)

Garrett, L. (1994). *The Coming Plague: Newly Emerging Diseases in a World Out of Balance*. Penguin Books:New York.

Figure and Table References

Figure 1. Courtesy Janet Yagoda Shagam