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Three Steps and a Hop

A Foodborne Illness Outbreak Case Study

01/19/2017

CSTE Food Safety Subcommittee Webinar

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CDC Centers for Disease Control and Prevention
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Epidemiologic Case Studies

CDC > [Epidemiologic Case Studies](#) > [Classroom](#)

Epidemiologic Case Studies	
Computer-Based +	Foodborne Disease Case Studies    The foodborne disease case studies available: <ul style="list-style-type: none"> • Botulism in Argentina • Gastroenteritis in Texas • Multistate Outbreak of Cyclosporiasis • Multistate Outbreak of <i>E. coli</i> O157:H7 • Salmonella in the Caribbean
Classroom -	
Instructor's Guide	
Foodborne Disease -	
Botulism in Argentina	
Gastroenteritis at a University in Texas	
Multistate Outbreak of Cyclosporiasis	
Multistate Outbreak of <i>E. coli</i> O157:H7 Infection	
<i>Salmonella</i> in the Caribbean	
Waterborne Disease +	
Outbreak Simulation: Pharyngitis in Louisiana (CB3050)	
Purchase Case Studies	

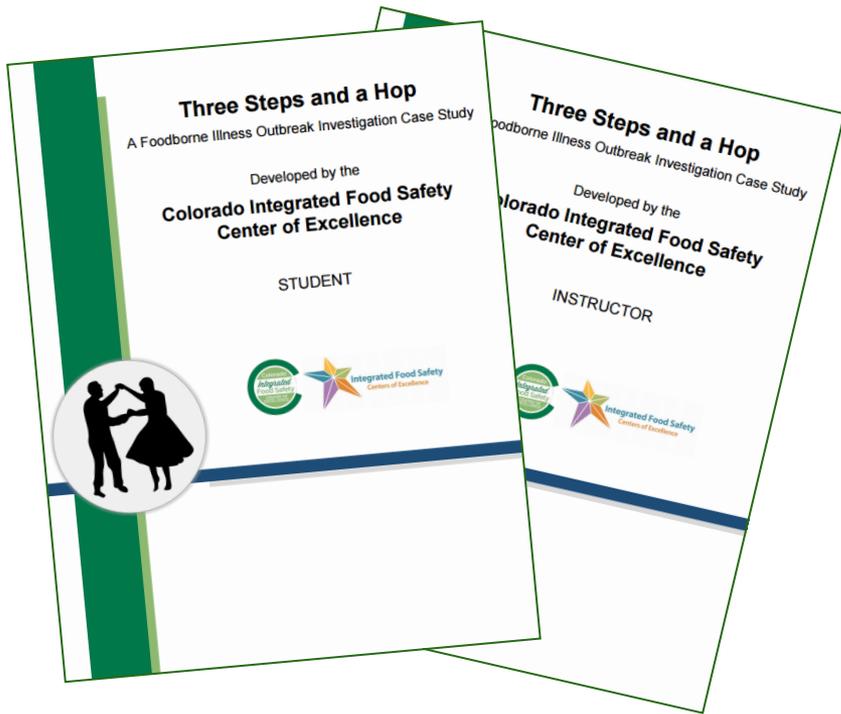
- **Scope:** local, complaint-based cohort study adapted from a 2011 outbreak investigated by El Paso County, CO

- **Target audience:** public health students and public health professionals who are new or novice to foodborne illness outbreak investigations

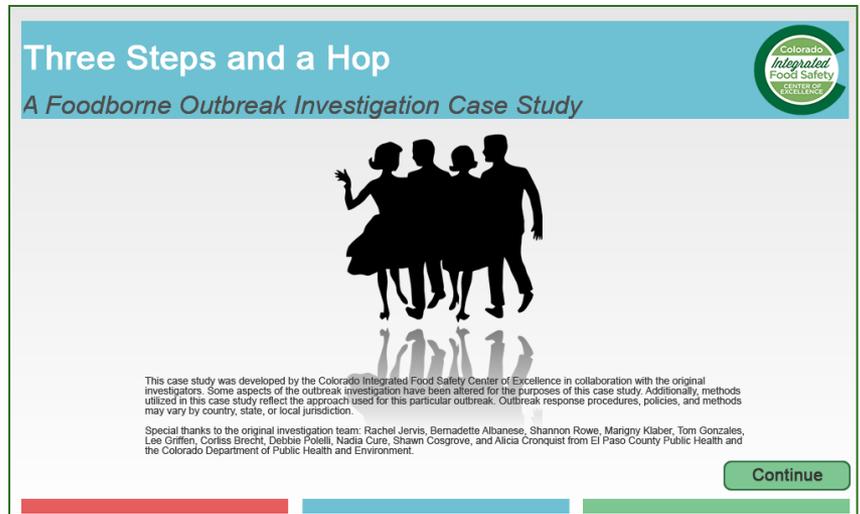
- **Prerequisites:** basic knowledge of epidemiologic concepts and methods



Paper-Based Version



Online Version



Three Steps and a Hop
A Foodborne Outbreak Investigation Case Study



This case study was developed by the Colorado Integrated Food Safety Center of Excellence in collaboration with the original investigators. Some aspects of the outbreak investigation have been altered for the purposes of this case study. Additionally, methods utilized in this case study reflect the approach used for this particular outbreak. Outbreak response procedures, policies, and methods may vary by country, state, or local jurisdiction.

Special thanks to the original investigation team: Rachel Jervis, Bernadette Albanese, Shannon Rowe, Marigny Klaber, Tom Gonzales, Lee Griffen, Corliss Brecht, Debbie Pielelli, Nadia Cure, Shawn Cosgrove, and Alicia Cronquist from El Paso County Public Health and the Colorado Department of Public Health and Environment.

Continue



Paper Version Overview

- Student packet vs. Instructor guide
- Single downloadable PDF, with attached appendices
- Designed for a small group setting, led by an instructor with experience in foodborne outbreak investigations
 - In-person tabletop
 - Bi-directional video conferencing
- Encourages collaboration and discussion amongst “students”, with guidance from the instructor
- Estimated time to completion: 2-2.5 hours

Instructor notes and suggested guidance



Answers and guided responses



Three Steps and a Hop

PART A: BEGINNING THE INVESTIGATION

Initial Complaint Call

At 12:55pm on Monday, March 14th an epidemiologist from the El Paso County Public Health Communicable Disease Program received a phone call from the president of a Polka Dance Club, Joy Johnson. Joy was calling on behalf of dance club members who reported becoming ill following the annual Hippety-Hop Dance Festival.

I (Optional) Instructor, ask students to refer to the timeline at the end of their packet and fill in events as they progress through the case study.

Question 1: What additional information should you request from Joy Johnson? What questions would you ask her?

Q You should try to obtain as much information as possible during the initial complaint call in case you are unable to contact the complainant again. Gather as much information as you can about the ill people and the event. You should also obtain contact information for the complainant.

Questions for Joy may include:

Information about the ill people:

- What type of symptoms are people reporting?
- Has anyone visited a health care provider or received a specific diagnosis?
- What were the ages of those affected?
- Where were festival attendees from? Where did they stay?

Information about the event:

- Where was the festival held?
- How many people attended the festival?
- Was food served? Who prepared the food?
- Do you have contact information for the restaurant or catering company?
- Do you have a list of all attendees?

Contact information for the complainant:

- May I contact you again if I have additional questions?
- Can I have your telephone number or email address?



Paper Version Highlights

- Determine information to collect on a questionnaire
- Develop a case definition
- Use a line list to determine who should be included in the study
- Create and interpret an epidemic curve
- Choose the correct study design
- Calculate the appropriate measures of association
- Discuss environmental assessment tasks
- Use external resources (IAFP Keys, CIFOR Table)



Online Version Overview

- Interactive alternative to the paper version when a group setting isn't available
- Can be completed as an individual
- Allows users to start and step away if needed
- Covers the same learning objectives, but the material is presented differently than the paper version
- Caters to a different preferred learning style
- Estimated time to completion: 1.5-2 hours

Narrated audio to walk users through the case study.

Just another Monday afternoon at El Paso County Public Health, when you receive a call from an unknown number.



Click the phone to answer.

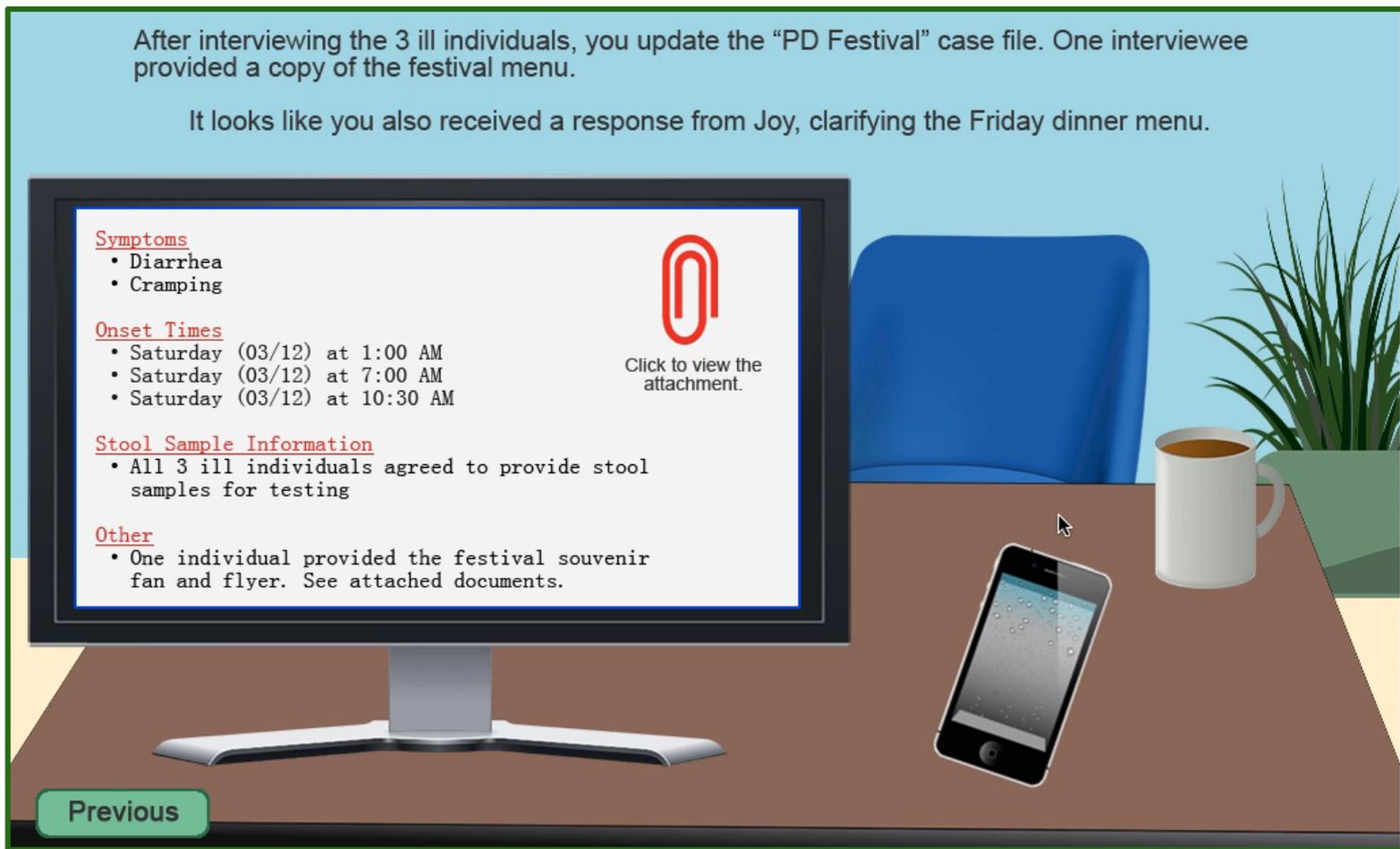
Previous



Designed to simulate an outbreak investigation, where investigators would receive pieces of information at a time.

After interviewing the 3 ill individuals, you update the “PD Festival” case file. One interviewee provided a copy of the festival menu.

It looks like you also received a response from Joy, clarifying the Friday dinner menu.



The image shows a computer monitor on a desk. The monitor displays the following text:

- Symptoms
 - Diarrhea
 - Cramping
- Onset Times
 - Saturday (03/12) at 1:00 AM
 - Saturday (03/12) at 7:00 AM
 - Saturday (03/12) at 10:30 AM
- Stool Sample Information
 - All 3 ill individuals agreed to provide stool samples for testing
- Other
 - One individual provided the festival souvenir fan and flyer. See attached documents.

To the right of the text on the monitor is a red paperclip icon with the text "Click to view the attachment." below it. On the desk in front of the monitor is a smartphone, a white coffee cup, and a green plant in a pot. A mouse cursor is pointing at the smartphone. In the bottom left corner of the monitor frame, there is a green button with the word "Previous" written on it.

Previous

Built in a variety of different interaction types.

It's time to assemble and notify your outbreak team. Choose who should be part of the team by matching their photo to their role in the outbreak. **Drag and drop the photo to the correct box.** Click "Submit" to check your answers.

 Brittany Public Health Nurse	 Dan Cancer Registry Manager	 Rachel Epidemiologist	<input type="checkbox"/>	Organizes data collection, analyzes and summarizes data, and disseminates information
 Elaine Public Health Lab Tech	 Angelina Human Resource Manager	 Michael Communications Officer	<input type="checkbox"/>	May conduct interviews and assist with specimen collection
 Alice State Veterinarian	 Leroy Water Quality Manager	 Randy Environmental Health Specialist	<input type="checkbox"/>	Conducts site visit and environmental assessment
<input type="button" value="Previous"/> <input type="button" value="Continue"/>			<input type="checkbox"/>	Tests specimens to identify causative agent
			<input type="checkbox"/>	Disseminates information and updates to the public and media.
			<input type="button" value="Submit"/> <input type="button" value="Reset"/>	

Use of externally linked resources to complete the activities.

Elaine at the public health lab is waiting for your call. In order to start running tests, she needs to know what pathogens to test for.

Use the [Council to Improve Foodborne Outbreak Response "Onset, Duration and Symptoms Table"](#) to decide which pathogens should be tested. Click on the sticky note that correctly identifies pathogens of interest.

Known Information

- Point source outbreak
- Incubation period range = 7-22 hrs
- Median incubation = 12.25 hrs
- Primary symptoms = Lower gastrointestinal (cramps, diarrhea)

Staphylococcus aureus	Giardia lamblia	C. perfringens & B. cereus
Salmonella	Organic Mercury	Enteric viruses

Click to view the "Onset, Duration, and Symptoms Table"

Previous

One of the key features of the online version is the ability to download and analyze a real dataset, with suggested use of statistical tools such as Excel, *Epi Info*, *OpenEpi*, etc .



The screenshot shows an interactive case study interface. At the top, five people are seated at a desk. Above them are three green speech bubbles containing text. On the desk, there is a folder labeled 'Festival Questionnaire' and a laptop displaying 'Interview Dataset'. Below the folder and laptop are two text prompts: 'Click the folder view the festival questionnaire' and 'Click the envelope to familiarize yourself with case study dataset'. At the bottom of the interface are two green buttons labeled 'Previous' and 'Continue'.

Speech bubble 1: We had trained public health students [conduct interviews](#) with Friday night dinner attendees. I also left a copy of the questionnaire on your desk and emailed you the completed dataset.

Speech bubble 2: Since this is a well-defined group, we're going to conduct a cohort study using everyone who attended the Friday night dinner.

Speech bubble 3: We'll also need to conduct an [environmental assessment](#) of the caterer and the kitchen.

Folder label: Festival Questionnaire

Laptop label: Interview Dataset

Text prompt 1: Click the folder view the festival questionnaire

Text prompt 2: Click the envelope to familiarize yourself with case study dataset

Buttons: Previous, Continue

Calculating relative risk.

Using the downloaded **dataset**, complete the 2x2 tables summarizing exposure by illness status for **brisket** and **mashed potatoes**.

Note: It is helpful to create a 2x2 table for the entire meal, but not always necessary.

Brisket

	Ill	Well
Ate brisket		
Did not eat brisket		

Mashed Potatoes

	Ill	Well
Ate mashed potatoes		
Did not eat mashed potatoes		

Submit

Undo

Drag and drop the number circles below into their correct cell to complete the **Brisket** and **Mashed Potatoes** 2x2 table. Press the "Submit" button once complete to check your answers.

26	13	32	2	1	15	25	8	0	34
4	51	23	29	24	3	31	28	14	

Previous

Continue

Environmental assessment component.

At 3:00 PM on Monday, March 14, Randy visits Charlotte at her place of work to conduct an interview. Randy cannot do an environmental assessment of the catering kitchen because all of the food was prepared in the caterer's private residence. However, he is able to inspect the Polka Dance Club kitchen.

Click on **items in the kitchen** that could be contributing factors that may have increased the risk of foodborne illness from the Friday night dinner.

Click on the "continue" button to view the [Environmental Health Investigation Report](#).





Case study wrap-up, completion certificate, and additional resources.

Investigation Conclusion

You wrap up the outbreak by communicating your findings in an outbreak report for the state health department and a NORS report for the CDC. The environmental health program issued a cease and desist order to “Catering by Charlotte” until she obtains the proper license. You also presented your findings to Joy, the President of the Polka Dance Club. Joy asked many questions regarding best practices of finding and hiring a licensed caterer, which you gladly answered in hopes of helping prevent any future illness at the Hippetty-Hop Festival. Joy invites your investigation team to attend the Hippetty-Hop Festival next year. [Click here to see the full outbreak report!](#)

Tools and Resources

Certificate and Feedback Survey

Credits and Attributions



Available at cofoodsafety.org

The screenshot shows a web browser window with the address bar displaying "cofoodsafety.wixsite.com -- Error". A search dropdown menu is open, showing the following results:

- Top Hit**
 - Error** cofoodsafety.wixsite.com
- Google Search**
 - cofoodsafety.
- Bookmarks and History**
 - Home | Colorado Integrated Food Saf... cofoodsafety.org
 - ejitt | - Interviewing Food Workers cofoodsafety.wixsite.com/ejitt/food-hand...
 - ejitt cofoodsafety.wixsite.com/ejitt
 - ejitt | CLINICAL cofoodsafety.wixsite.com/ejitt/clinical-sp...
 - ejitt | RECORD REVIEW cofoodsafety.wixsite.com/ejitt/copy-of-...
 - ejitt | MAKING OBSERVATIONS cofoodsafety.wixsite.com/ejitt/copy-of-f...

The background of the browser window shows the Google search homepage with the Google logo, a search input field, and "Google Search" and "I'm Feeling Lucky" buttons. In the top right corner of the browser window, there are links for "Gmail", "Images", and a "Sign in" button. At the bottom of the browser window, there are links for "Advertising", "Business", "About", "Privacy", "Terms", and "Settings".



Thank you!

Questions?