

Environmental Health Specialists' Outbreak Investigation Practices: A Qualitative Study

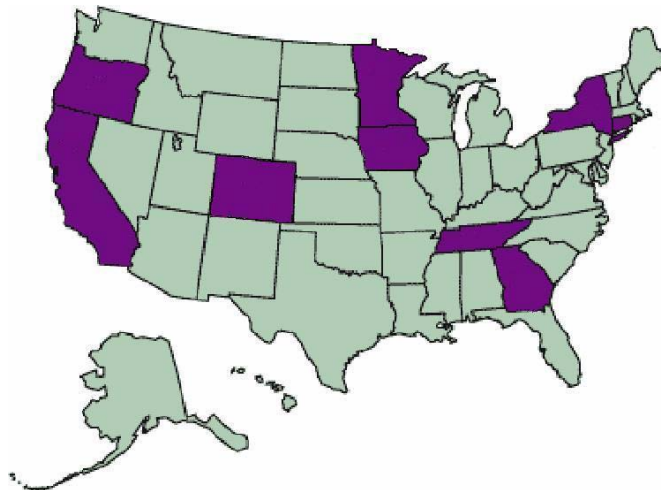
National Environmental Health Association
2005 Annual Education Conference
June 26-29, Providence, Rhode Island

Laura Green, Ph.D. (lrgreen@cdc.gov)
Environmental Health Specialists Network
National Center for Environmental Health
Centers for Disease Control and Prevention

Environmental Health Specialists Network (EHS-Net)

EHS-Net is a partnership among:

- Centers for Disease Control and Prevention (CDC)
- Food and Drug Administration (FDA)
- U.S. Department of Agriculture (USDA)
- 10 states (CA, CO, CT, IA, GA, MN, NY, OR, RI, TN)



EHS-Net's Goals:

- Identify:
 - **Contributing factors:** factors that contribute to foodborne illness (FBI) outbreaks
 - **Environmental antecedents:** factors that lead to the occurrence of contributing factors

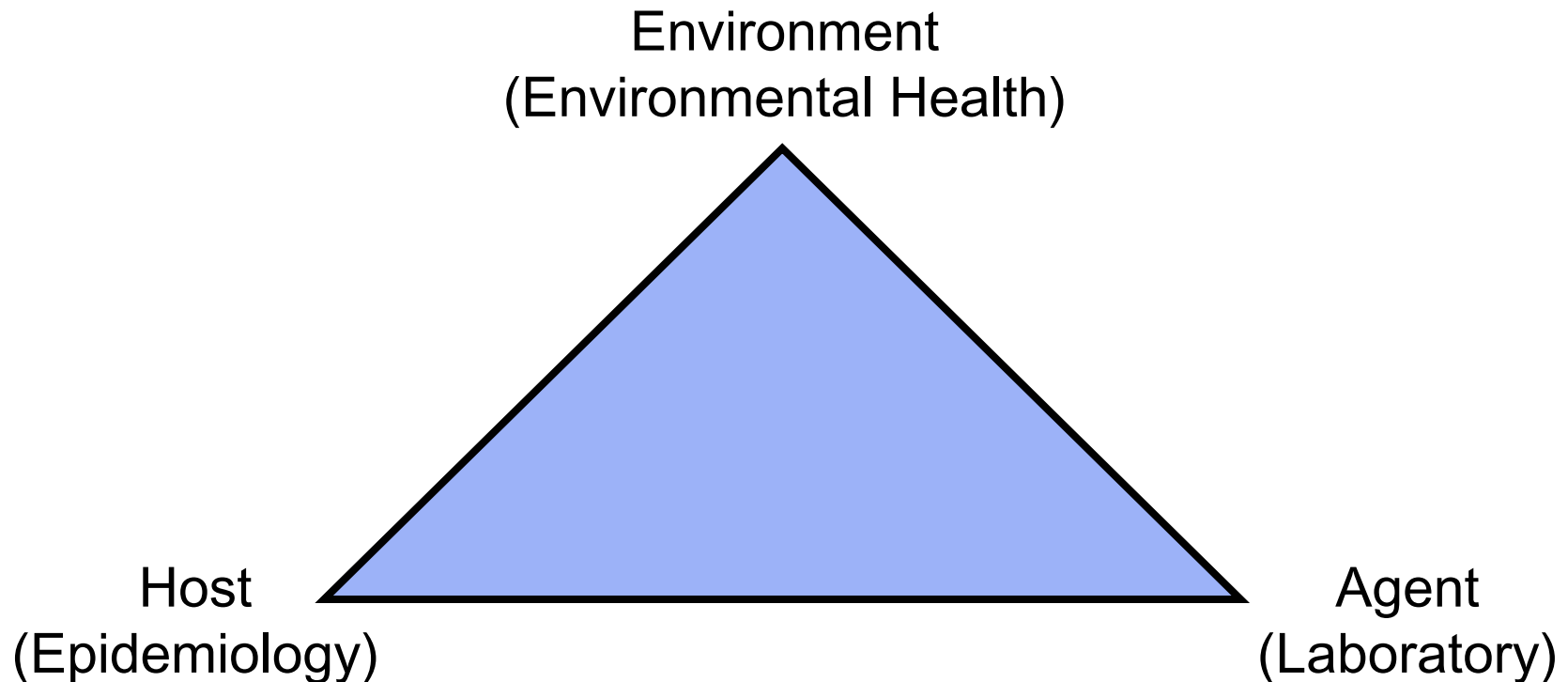
Example: *E. coli* outbreak associated with hamburger

- **Contributing factor:** inadequate cooking of hamburger
- **Environmental antecedent:** cook's lack of knowledge about cooking temperatures

EHS-Net's Goals:

- Improve FBI prevention efforts
- Offer training opportunities to environmental health specialists (EHSs)
- Strengthen the relations among epidemiology, laboratory, and environmental health (EH) programs

Integrating Epidemiology, Laboratory Science, and Environmental Health



EHS-Net's current focus is FBI outbreaks associated with restaurants because

- FBI outbreaks are frequently associated with restaurants, and
- all EHS-Net state partners have authority in restaurants.



Introduction

- EHSs in EH programs are important to restaurant food safety, because they:
 - conduct restaurant inspections,
 - provide food safety education to food workers, and
 - participate in FBI outbreak investigations.

- To gain a better understanding of EHSs' practices concerning their food safety activities, EHS-Net spearheaded this study.

Purpose and Method

Purpose

- Collect **qualitative** data on EHSs' restaurant food safety practices

Method

- Focus groups
 - Focus groups provide
 - ◆ qualitative data and
 - ◆ data that can be used to guide future quantitative research.
 - Focus groups do **not** provide
 - ◆ quantitative data and
 - ◆ data generalizable to other groups or populations.

Discussion Topics

- FBI outbreak investigation practices
- Methods of identifying contributing factors (CFs) to FBI outbreaks
- Success at identifying CFs to FBI outbreaks
- Difficulties faced when conducting FBI outbreak investigations

Purpose and Method

Design

- 6 telephone focus groups with 5-8 participants each (42 total) were conducted
- Focus groups were audiotaped and transcribed, and common themes across groups were identified

Participants

- Recruited through telephone calls to randomly selected EHSs working in state or local EH programs in the EHS-Net states (CA, CO, CT, GA, MN, NY, OR, TN)
- Received a \$60 reimbursement for their time



Purpose and Method

Characteristics of Study Participants

Characteristic	%	Characteristic	%
Gender		Education	
Male	50	Some college/2-year degree	2
Female	50	4-year college degree	69
Age		Postgraduate degree	29
18-24	2	Employer	
25-44	53	City/Township	17
45-54	38	County/District	57
55 and older	7	State	19
Hispanic/Spanish origin	7	Other	7
Race		Certifications	
White	86	NEHA Registered Sanitarian or	
Black	10	Registered EHS	31
Other	4	NEHA certified food safety	
		professional	7
		Registered in state	57

Median years of experience = 8 (quartiles: 25% = 4, 75% = 15)

FBI Outbreak Investigation Practices

- About half of the participants had not been involved in FBI outbreak investigations.
- Reasons:
 - No outbreaks occurred
 - Outbreak investigation not a priority
 - EH programs only minimally involved in investigations



Findings

FBI Outbreak Investigation Practices

- Most participants said an inspection was a primary activity.
 - Some conducted “routine inspections.”
 - Many said outbreak inspections differed from routine inspections, as they focused more on
 - ◆ preparation practices associated with the suspected food,
 - ◆ preparation practices associated with FBI, and
 - ◆ employee hygiene and health.
 - Some said they conducted “environmental investigations,” “food flows,” and “food preparation reviews.” A few referred to Hazard Analysis Critical Control Point (HACCP).

“[I conduct] an expanded HACCP review of any suspect foods.”

FBI Outbreak Investigation Practices

- Other investigation activities included
 - identifying restaurant customers,
 - developing and conducting food history questionnaires,
 - collaborating with epidemiologists,
 - conducting epidemiologic analyses,
 - taking food and stool samples, and
 - collaborating with public health nurses.

FBI Outbreak Investigation Practices

- The nature of the collaboration between EH and epidemiology varied considerably.
 - Close collaboration, overlapping roles
 - “Our communication is very good and we have a very strong team approach.”
 - Collaboration, defined roles
 - Epidemiologists interview restaurant customers, EHSs conduct restaurant investigation**
 - Little collaboration
 - “... they just send us out to do the inspection and don't keep us informed...”

Methods for Identifying CFs to FBI Outbreaks

Participants:

- Focused on identifying the food item and/or the pathogen, not CFs.
- Said CF identification was dependent on food item and/or pathogen identification.
- Used several sources of information in identifying the food item, pathogen and CFs.
 - Illness characteristics

“Let’s say it was a Chinese restaurant and the incubation was classic for *Bacillus cereus*, we would investigate the rice [with a focus on] cooling.”
 - Epidemiologic analysis of common foods
 - Restaurant investigation (often guided by illness characteristics, suspected pathogens and/or food)

Success at Identifying CFs to FBI Outbreaks

Participants:

- Often could make educated guesses about the pathogen, but did not always get laboratory confirmation.

“We might know from the incubation period, but if we don’t have lab confirmation, we can’t say for sure.”

- Were sometimes able to identify CFs through observation of practices and interviews with employees.
- Said identifying CFs was difficult because of:
 - employee turnover,
 - notification delay, and
 - uncooperative employees.

FBI Outbreak Investigation Difficulties

Restaurant Industry

Lack of cooperation

Restaurant Customers

Contact constraints

Difficulty obtaining food histories

Lack of cooperation

Lack of knowledge

FBI Outbreak Investigation Difficulties

EH Organization

Lack of epidemiologic assistance or a team approach

Lack of training and experience in outbreak investigation

Lack of support from EH management

Lack of cooperation between agencies

Lack of staff

Other

Notification delay

Lack of cooperation from physicians

FBI Outbreak Investigation Practices and CF Identification

- Variation in the extent to which EHSs
 - were involved in outbreak investigations,
 - engaged in activities likely to identify CFs in the environment, and
 - collaborated with epidemiology.
- EHSs did not often identify CFs, as
 - they focused on the pathogen, and
 - barriers made it difficult to identify CFs.

FBI Outbreak Investigation Practices and CF Identification

Information on CFs is valuable, as it allows us to

- develop a more complete understanding of the causes of FBI outbreaks, and
- develop and improve FBI prevention strategies.

FBI Outbreak Investigation Practices and CF Identification

- To identify CFs, EHSs need to
 - be involved in FBI outbreak investigations, and
 - engage in activities that allow them to identify CFs.
- The role of EH in FBI outbreak investigations needs to be defined and, once defined, supported.

Investigation Difficulties

Difficulty: Restaurant employees

Early involvement of EH may assist in obtaining more accurate information and cooperation from employees.

Difficulty: Restaurant customers, public

FBI education programs could increase the public's

- cooperation with and understanding of FBI outbreak investigations, and
- understanding of when they should report gastrointestinal illnesses to health departments.

Investigation Difficulties

Difficulty: EH organizational issues

Defining the role of EH in outbreak investigations and supporting that role should assist in addressing these issues.

Difficulty: Outbreak notification delay

Improving the collaboration among state and local agencies and among epidemiology and EH programs should contribute to a shortened delay.

Investigation Difficulties

Difficulty: Physicians

Physician education programs concerning foodborne illness diagnosis and testing are needed. The physician primer on the diagnosis of FBI recently released by CDC is an important step in this educational process.

Web site:

<http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5304a1.htm>

EHS-Net Activities

- Developing a method and instrument for conducting environmental evaluations
- Providing training on environmental evaluations to EHSs
- Encouraging and supporting collaboration between epidemiology and EH
- Participating in a CDC/FDA work group on improving reporting of CFs

Other CDC Activities

■ **EDITS-Enteric Disease Investigation Timeline Study**

University of Minnesota is conducting a CDC-funded evaluation of outbreak investigation activity timelines, such as

- reporting of laboratory results, and
- foodborne illness complaint and outbreak investigations.

Other CDC Activities

■ **EFORS-Electronic Foodborne Outbreak Reporting System**

- This system allows state health departments to report foodborne illness outbreaks electronically.
- Web site:

http://www.cdc.gov/foodborneoutbreaks/reporting_outbreak.htm

Acknowledgments

We wish to thank:

- Sheryl Cates and Katherine Kosa (Health, Social and Economics Research, RTI International) for their assistance with study design, participant recruitment, and data collection; and
- EHS-Net (National Center for Environmental Health, CDC) for their help concerning study topics and questions and participant recruitment.

More Information

Laura Green:

lrgreen@cdc.gov

EHS-Net's Web site:

<http://www.cdc.gov/nceh/ehs/EHSNet>