

21st Century Environmental Health Outbreak Responsibilities

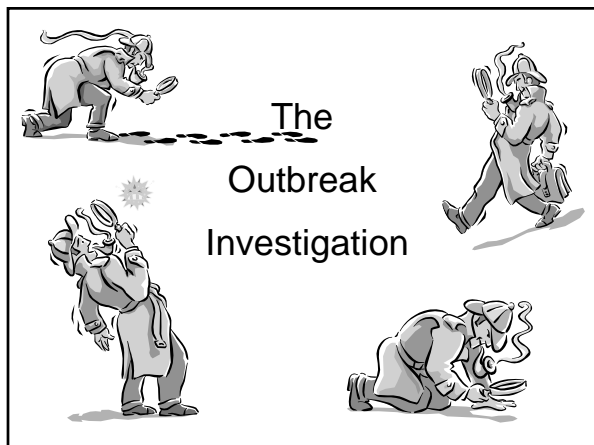
Finding the Elusive Contributing Factor

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How do we understand the “cause” of foodborne outbreaks?

How Can We Find Them



Foodborne Outbreaks

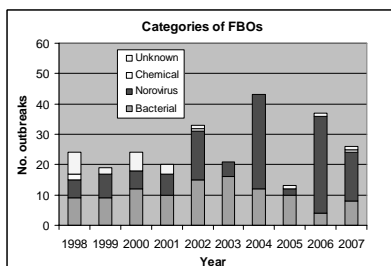
- **Outbreak (FBO):** two or more cases of a similar illness resulting from ingestion of a common food
- **Classic local/event outbreak:**
 - Example: illness in a group of people following a catered event (wedding, banquet, pot-luck) or following a meal at a common restaurant
- **Widespread/dispersed outbreak**
 - Example: National spinach *E. coli* outbreak in 2006; typically identified using laboratory data (PFGE).



Wisconsin Foodborne Outbreaks 1998-2007

Viral = 129
Bacterial = 105
Unknown = 21
Chemical = 5
Parasitic = 0

Total = 260



Why Investigate FBOs?

- **Immediate Needs**
 - Identify and remove any adulterated product still in use
 - Exclude any ill food handler who may still be working
 - Remedy improper food handling practices that are on-going
- **Long Term Goals**
 - Address public concern for safe food supply
 - Results may provide opportunity to learn more about known diseases or describe new diseases
 - Opportunity to evaluate existing prevention strategies
 - Results of the investigation may lead to new strategies for preventing future outbreaks

Components of a Foodborne Outbreak Investigation

- Identify and establish existence of outbreak
- Case ascertainment
- Data gathering / interviewing
- Formulate a working hypothesis
- Obtain clinical and environmental/food specimens for testing
- Conduct environmental investigation and implement interventions/control measures
- Data analysis and interpretation
- Summary report

Epidemiologic Investigation

- **Who conducts the epidemiologic investigation?**
 - Variable and depends on the size and scope of the outbreak
 - Usually combination of the following: PHNs, Environmental health specialists, epidemiologists, regional staff, other
- **What needs to be done**
 - Start a line list
 - Inquire about other ill persons
 - Ensure all appropriate agencies and parties are informed (local, state and federal)
 - Contact Communicable Disease Epidemiology Section (CDES)
 - Contact environmental health specialist at local, regional or state central office
 - Consider notifying local clinics, emergency rooms, physicians
 - other
 - Collect clinical specimens
 - Conduct case (and control/well) follow-up interviews
 - Compile and interpret epidemiologic, laboratory and environmental data
 - Analyze data and summarize findings



The Environmental Investigation

- Immediate objective must be to end the outbreak if it is on-going
 - Exclude ill food handlers
 - Traceback contaminated product and recall
 - Identify and change improper food handling practices
- Early epidemiologic information can often help guide the focus of the environmental investigation
 - Communication between involved parties
 - Coordinated efforts
 - Re-evaluation based on new information



Summary

- Communication between all partners throughout the course of the investigation is necessary
- Process of compiling, evaluating and re-evaluating the epidemiologic, laboratory and environmental information should be on-going
 - Constant evaluation of the most current information can result in new leads or avenues of inquiry
 - Coordinated efforts based on current information is key

What Are Contributing Factors?

Contributing factors represent the *circumstances* in the food preparation process that directly contribute to foodborne outbreaks



What is required in order to get to the underlying factors of the outbreak?"

Use of System Thinking To Understand Food Systems



Common Elements of Systems

Input: Energy or raw material that enters the system

Processes: The way input is transformed

Output: The product or service that results from the process

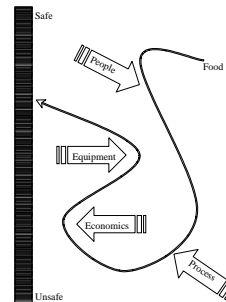
Feedback: Information that can be used to evaluate and monitor the system



How to conduct on-site outbreak investigations using the systems approach!



Systems Approach in a Food Safety Context



A foodservice establishment is a system with inputs, processes, outputs and feedback. As a system, these operations follow the general characteristics of any system and include complex underlying factors that determine how and why it operates. In a foodservice operation the underlying factors that affect the outcome might be organized into the following five categories:

- Food
- People
- Equipment
- Processes employed by the establishment
- Economics

