

NORTH CAROLINA'S FOODBORNE ILLNESS INVESTIGATION GUIDANCE AND TOOLS

This criterion applies to the functions of the program to define, collect, investigate, analyze, and provide information, which may prevent future foodborne illness.

REQUIREMENT

GS § 130A-144. Investigation and control measures.

(a)The local health director shall investigate, as required by the Commission, cases of communicable diseases and communicable conditions reported to the Local health director pursuant to this Article.

(e)The local health director shall ensure that control measures prescribed by the Commission have been given to prevent the spread of all reportable communicable diseases or communicable conditions and any other communicable disease or communicable condition that represents a significant threat to the public health.

PROCEDURES

The means by which these procedures are carried out may vary from county to county depending on number of staff, experience, and the presence of an EPI Team. The following are the general steps in a foodborne illness investigation.

- I. Initial complaint
 - A. Collect information and forward to appropriate person in agency
 1. If more than one complaint (from non-related individuals) about illness that may be related to a facility or event is received, confirm diagnosis and call Epi Team meeting to manage the investigation. Consider calling State Health Department (GCDC at 919-733-3419) and your Food Protection Branch Regional Environmental Health Specialist for assistance.
 2. Develop initial case definition (who, what, when, where). This can be changed as investigation proceeds. Start line listing and epi curve.
 - B. Develop initial questionnaire to determine common exposure site. Consider using the Foodborne Case Questionnaire found in the NC Communicable Disease Manual. Interview several cases to determine common exposure site [i.e. restaurant, event (wedding, basketball games, etc.)]
 - C. Once common exposure site is identified:
 1. Design and implement epidemiologic study (usually done by CD nurses with Epi Team assistance) [Note: For either study listed below it is highly desirable to have interviews of twice as many controls (well people who ate at same place during the same time period) as cases (ill people)]. From experience, this is needed to reach sufficient power.
 - a. Case-control studies look at illness and are the most common study done.
 - b. Cohort studies look at exposure.
 - c. Collect human specimens and send to State Lab of Public Health.
 - d. Design and implement environmental studies (conducted by EH).

- e. Field inspection and environmental sampling at exposure site.
 - 1. Sampling of potential food sources.
 - 2. Interviews of employees and collection of human specimens (in conjunction with CD nurse)
- D. Data analysis and interpretation
 - 1. In a computer database, enter epi study data on cases and controls and analyze. Case control studies will generate Odds Ratios and cohort studies will generate Attack Rates.
 - 2. Correlate epi study and environmental study results
- E. Implement control and prevention measures (both CD and EH). While this step is listed here, control steps are taken all the way through the investigation. Be sure to monitor the control and prevention measures to ensure they are applied and are working as intended.
- F. Report
 - 1. Use local and State Health Educators to educate and inform public and local/State PIOs write press releases and respond to media.
 - 2. Write an outbreak report and forward to GCDC (per 10A NCAC 41A.0103 (b) and (c))
 - 3. Complete CDC Summary Outbreak Report form and fax to GCDC at 919-715-4699. GCDC will send this report to CDC.
 - 4. Complete CD report cards on all cases.

Food-borne Illness Flowchart

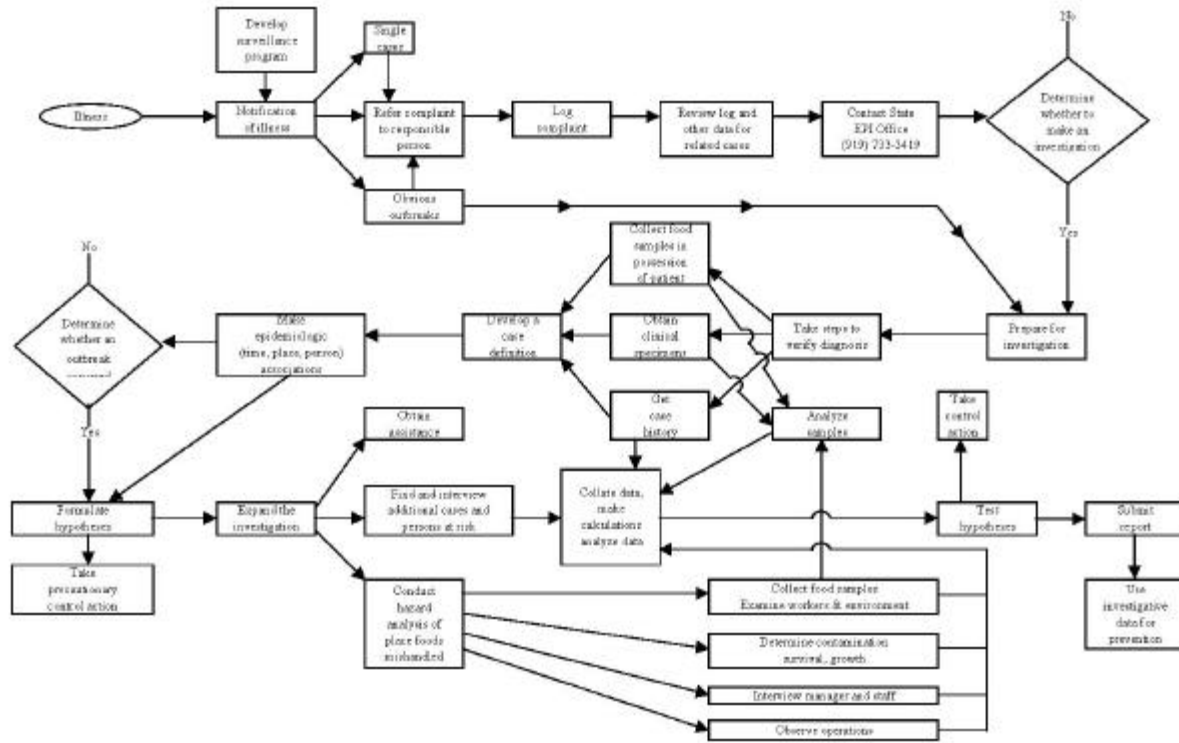


Figure 1. Sequential events in investigating a typical outbreak of foodborne illness.

RESOURCES

There are manuals, handbooks, websites, and contacts that will be useful during an outbreak investigation. Please note that the North Carolina Communicable Disease Control Manual contains a sample Investigation Questionnaire.

“IAMFES Procedures to Investigate A Foodborne Illness”

“Control of Communicable Diseases Manual” (APHA) – Go to www.apha.org and click on Books and other media for ordering information.

NC Communicable Disease Manual– <http://www.epi.state.nc.us/epi/gcdc/manual/toc.html>

EPI Notes

MMWR

EPI-INFO software from CDC

LINKS

Epi Info 3.3 (October 2004) - <http://www.cdc.gov/epiinfo/>

Multistate Foodborne Outbreak Investigations – Guidelines for Improving Coordination & Communication - http://www.fda.gov/ora/fed_state/NFSS/Outbreak_Coordination.pdf

WHO Fact Sheets - <http://www.who.int/inf-fs/en/fact237.html>

Food Microbiology Information Center - <http://science.ntu.ac.uk/external/fhc/>

CDC Foodborne Outbreak Response and Surveillance - <http://www.cdc.gov/foodborneoutbreaks>

The Bad Bug Book - <http://vm.cfsan.fda.gov/~mow/intro.html>

Food Hygiene, Microbiology and HACCP - <http://science.ntu.ac.uk/external/fhc/aspbook.htm>

Foodborne Disease Outbreak Articles and Databases of Interest

<http://www.cfsan.fda.gov/~mow/app5.html>

North Carolina State Program for Infection Control and Epidemiology (UNC)

<http://www.unc.edu/depts/spice/resource.html>

MINIMAL SAMPLING KIT

It is recommended that the items listed below be stored in a good-sized cooler (one that will be of sufficient size and insulation to transport food samples) in the Environmental Health Office at each County Health Department.

- At least 15 sterile bags.
- At least 15 sterile spoons.
- 6 specimen collection containers or devices.
- Temperature measuring devices.
- One of each of the supporting equipment (listed below).
- Sterilizing equipment.

Periodic resterilization or replacement of sterile supplies, media and transport media is required to maintain kit in a ready-to-use condition.

Supporting Equipment

- Fine-point marking pen.
- Roll of adhesive or masking tape.
- Labels and waterproof tags with eyelet and wire ties.
- Matches.
- Buffered distilled water or 0.1% peptone water (5 ml in screw capped tubes).
- Test tube rack.
- Insulated chest.
- Investigational forms and Chain of Custody forms.
- Sterilizing & Disinfecting Agents
 - Ethyl alcohol 95% solution.
 - Propane torch.
 - Sodium or calcium hypochlorite.
- Refrigerants
 - Ice.
 - Blue ice packs.
 - Rubber or plastic bags which can be filled with water and frozen.
 - Heavy-duty plastic bags for ice.
- Media
 - Tubes of transport media.
 - Pre-enrichment or enrichment broth as appropriate.

**EQUIPMENT USEFUL FOR FOODBORNE DISEASE
OUTBREAK INVESTIGATIONS FROM IAMFES**

1. **Sterile sample container**-Plastic bags (disposable or Whirl-Pak type), wide-mouth jars (6 oz to 1 qt capacity) with screw caps, water sample bottles (bottles for chlorinated water should contain enough sodium thiosulfate to provide a concentration of 100 mg of this compound per ml of sample), foil or heavy wrapping paper, metal cans.
2. **Sterile and wrapped sample collection implements-Spoons, scoops, tongue-depressor blades, butcher knife, forceps, tongs, spatula, drill bits, metal tubes 15 to 30 cm (1/2 to 1 in) in diameter, 360 to 720 cm (1 to 2 ft) long pipets, scissors, swabs, sponges, Moore swabs (compact pads of gauze, made from 1440 cm (4ft) x 180 cam (6in) strip, tied in center with a long, stout twine or wire-for sewer, drain, stream, pipeline samples.**
3. **Specimen collecting equipment**-cartons (with lids) for stool specimens, bottles containing a preservative and transport solutions, stool specimen protective canisters and cartons, sterile swabs, sterile sponges, rectal swab kits, sterile 10 x 10 cm (4 x 4 in) gauze pads, tubes of transport media.
4. **Supporting Equipment**-Fine-point marking pen, roll of adhesive or masking tape, labels, waterproof cardboard tags with eyelet and wire ties, electric drill, matches, .1% peptone water or buffered distilled water (5 ml in screw capped tubes), test tube rack, insulated chest, investigational forms.
5. **Sterilizing and disinfections agents**-95% ethyl alcohol, propane torch, sodium or calcium hypochlorite.
6. **Refrigerants**-canned ice, refrigerant in plastic bags, liquid in cans, rubber or plastic bags which can be filled with water and frozen, heavy-duty plastic bags for ice. Transport media, preenrichment or enrichment broth.
7. **Media**-Tubes of transport media, preenrichment or enrichment broth, as appropriate.
8. **Clothing (optional)**-White coveralls or laboratory coat; either paper hats, hardhat or hairnets, disposable plastic gloves; disposable plastic boots.

