Primary Health Care Initiatives (PHCI) Project
Contract No. 278-C-00-99-00059-00
Abt. Associates Inc.

EPIDEMIC INVESTIGATION

LEARNING OBJECTIVES

- Define an epidemic.
- Know the types and characteristics of epidemics
- Know why to investigate an epidemic
- Understand the importance of a case definition
- Know the steps in conducting an investigation
- Understand how to interpret an epidemic curve
- Know what elements should be included in a report

TEACHING STRATEGIES

- Informal lecture/discussions
- Questions and input from trainees should be encouraged
- Use examples such as those attached to demonstrate various forms of epidemics

MATERIALS AND EQUIPMENT NEEDED

- Overhead projector and transparencies of notes and attachments
- Flipchart and markers

LEARNING POINTS

- Definition of an epidemic
  - An **epidemic** is the occurrence in a community or region of a number of cases of a disease that is usually large or unexpected for that place and time (Bries, 1986)
  - An **endemic** disease is the **usual** occurance of a disease in a given geographic area
  - An epidemic is a number of cases of disease that is greater than the endemic rate, (the normal baseline incidence of that disease)
- Types of epidemics.
  - Common vehicle - point source (single exposure).
    - Definition: - the susceptible individuals are exposed more or less simultaneously to one source of infection. This results in a very rapid increase in the number of cases, often in a few hours
    - Example - The cholera epidemic in Attachment 1 is an example of a point-source epidemic
  - Propagated (person to person)
    - Definition - The disease is passed from person to person and the initial rise in the number of cases is slower.
    - Example - the measles outbreak (Attachment 2)
  - Mixed

- Steps of investigation of an epidemic
  1. Suspect or recognize presence of an epidemic (unusual number of cases of disease for that time or place)
     - This implies awareness of an unusual clustering of similar cases
     - This implies that the usual incidence for this disease is approximately known
  2. Identify cases
     - Use a standard case definition to identify most cases – may be somewhat flexible in early cases
       - Should be as simple as possible
       - Should be easily applied in the PHC
       - Should identify majority of those with the disease (Sensitive) and exclude the majority of those without the disease but who may have similar symptoms (Specific)
     - Example of case definition for salmonella food poisoning:
       - Diarrhea of more than 4 loose stools/day, **AND**
       - Abdominal pain, **AND**
       - Fever > 38.5° C.
     - Apply standard case definition to search for affected people
       - Patients who present to the Health Center
       - Home visits of affected patients to examine family members
       - Ask community organizations (women's groups, religious groups, political groups) to help finding affected people and refer them to Health Center
     - Keep a list of affected people, and describe cases by place, time, and person.
  3. Verify the diagnosis by clinical exam, laboratory, etc.
  4. Report to the appropriate authorities. They will assist in the following:
     - Draw an epidemic curve (such as those in the attachments) and make a judgment as to the expected time and place of exposure
     - Obtain data about other possible exposures which have no current symptoms
     - Collect environmental samples as needed: food, water, etc.
     - Recommend control measures as appropriate
     - Evaluate the control measures
     - Recommend preventive measures to prevent future outbreaks

GROUP EXERCISES

1. Develop a standard case definition (using the above criteria and example) for the following epidemic problems:
   a. Staphlococcal food poisoning
   b. Streptococcal pharyngitis (NOT a simple cold or viral pharyngitis)
   c. Scabies in school children

2. You have just noticed that at least 10 people in the past 3 days have visited the Health Center because of acute vomiting and diarrhea. In most cases, the vomiting and diarrhea began between Tuesday and Wednesday, and was improved within 36 hours. None of the affected patients had fever, but all were complaining of severe abdominal cramping pains. Most of them were members of the same extended family. Normally you see 3 – 4 people per week with these symptoms.
   a. Is this an epidemic? Give your reasons.
   b. What is the case definition of this problem, given the information listed?
   c. What could you do to further investigate this problem?

3. You are in a Health Center that has responsibility for 4 local elementary schools. The director of one of the schools calls you because many of the children in several classes are scratching their arms and legs and many appear to have a rash. When you visit the school and examine some of these children, you find evidence of scabies in 12 out of the 15 children that you examine.
    a. Is this an epidemic? Give your reasons.
    b. What could you do to further investigate this problem?

CRITICAL ELEMENTS OF COMPETENCE FOR EVALUATION

- Able to conduct epidemiological investigations
- Understand when to conduct the investigation
- How to collect and report the findings
- How to use the findings for interventions and future program planning

Attachment 1

Attachment 2