



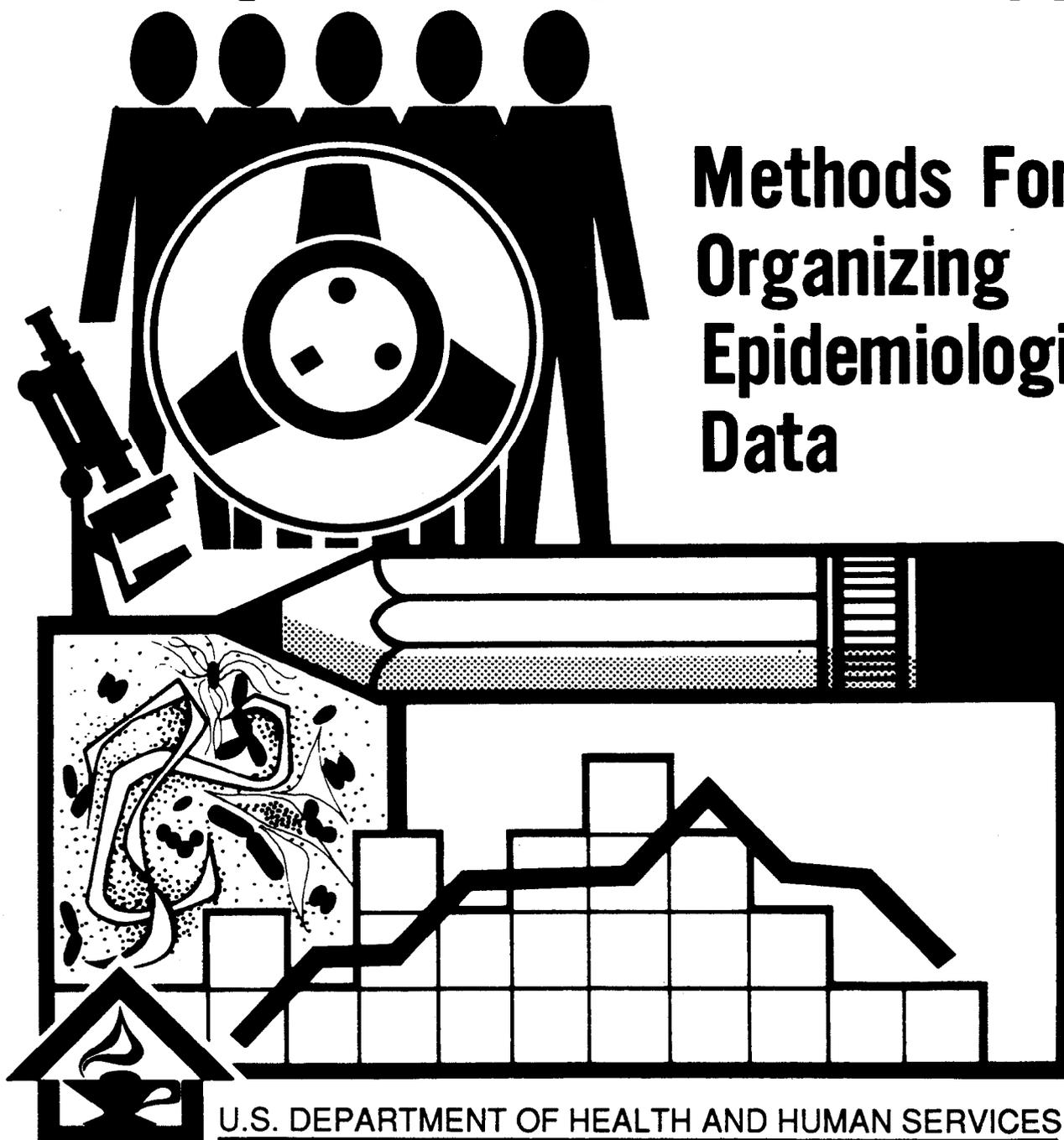
LESSON

4

SELF-STUDY COURSE 3030-G

Principles of Epidemiology

Methods For Organizing Epidemiologic Data



U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES

SELF-STUDY

PUBLIC HEALTH SERVICE

Centers for Disease Control

Training and Laboratory Program Office

Division of Training

Atlanta, Georgia 30333

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PRINCIPLES OF EPIDEMIOLOGY

Self-Study Course 3030-G

LESSON 4: METHODS FOR ORGANIZING EPIDEMIOLOGIC DATA

Tables - Graphs - Charts

I: LESSON CONSISTS OF:

Part I: 25 multiple choice questions

II: PRIMARY REFERENCE:

Manual 4 - "Methods for Organizing Epidemiologic Data"

NOTE: This manual is provided by CDC and should be included when you receive this lesson.

III: TOPICS AND READING ASSIGNMENTS:

	<u>Page</u>
A. Introduction	1- 2
B. Tables	2- 7
C. Graphs	7-21
D. Charts	22-28
E. Glossary of Terms	30-31
F. Decision Guide to Selecting a Method of Illustrating Epidemiologic Data	32-35
G. Exercise on the Organization of Epidemiologic Data	36-50
H. Answers to the Exercise Problems	51-64

PRINCIPLES OF EPIDEMIOLOGY

Lesson 4

Objectives

Upon successful completion of Lesson 4, the student should be able to correctly:

- Organize epidemiologic data, when given a set of data consisting of a line listing of cases, with selected characteristics of each, by selecting and using methods which are most appropriate and which are in conformance with generally recommended practices (i.e., arithmetic scale line graph, semi-logarithmic scale line graph, histogram - equal interval, frequency polygon - equal interval, bar chart, maps - spot and area).
- Identify true differences in the frequency of occurrence and the distribution of cases in a population.

PRINCIPLES OF EPIDEMIOLOGY

Lesson 4

METHODS FOR ORGANIZING EPIDEMIOLOGIC DATA

Tables - Graphs - Charts

Part I: Multiple Choice

1. Epidemiologic data are organized into tables, graphs and charts for the purpose of:
 - A. Identifying frequency of occurrence and distribution of events.
 - B. Preparing epidemiologic reports.
 - C. Calculating various statistical measures of epidemiologic importance.
 - D. Identifying long-term trends by the variables of person and place.
2. In general, the number of main points made in any one table, graph or chart:
 - A. Is limited primarily by the scale of the illustration.
 - B. Should be limited to one.
 - C. Is a function of the number of independent variables.
 - D. Should not be more than can be easily understood.
3. Of the following, which best describes the features common to tables, graphs and charts?
 - A. The title
 - B. The body of information
 - C. The source of the information
 - D. All of the above
4. Which one of the following titles most clearly describes the material presented in this table? The cases are of disease "x" occurring in Varsolonia.

NUMBER OF CASES

Year	Reported	Investigated	Confirmed	Treated
1983	36	36	32	31
1984	21	17	12	9
1985	43	22	11	6
TOTAL	100	75	55	46

4. (continued)

- A. Cases of Disease in Varsolonia during three years
- B. Cases of Disease "x" Reported in Varsolonia, 1983-1985
- C. Number of Cases of Disease "x" that were Reported, Investigated, Confirmed and Treated, by Year, in Varsolonia, 1983-1985
- D. Number of Cases of Disease "x", by Year, That Were Reported, Investigated and Treated Following Confirmation of the Diagnosis, 3 Years

5. Study the table below.

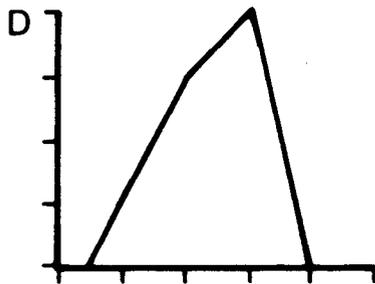
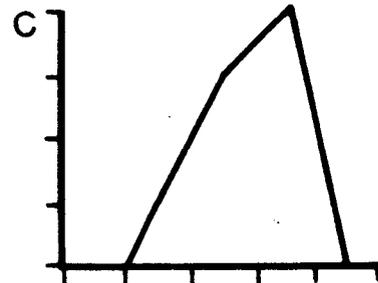
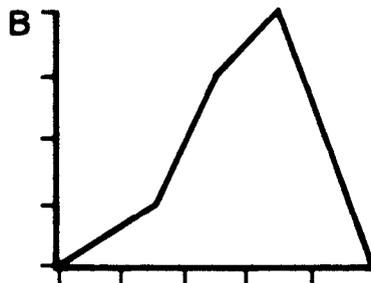
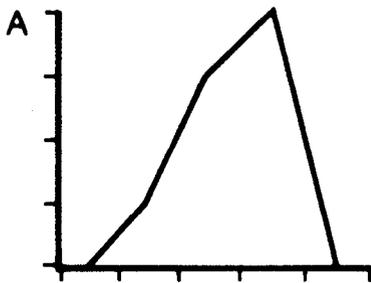
NUMBER OF CASES OF DISEASE "x" BY AGE, SEX AND RACE, SAMPLE CITY, 1985

Age	Number of Cases by Race and Sex											
	White			Black			All Other			Total		
	M	F	T	M	F	T	M	F	T	M	F	T
< 15												
15 - 30												
> 30												
TOTAL												

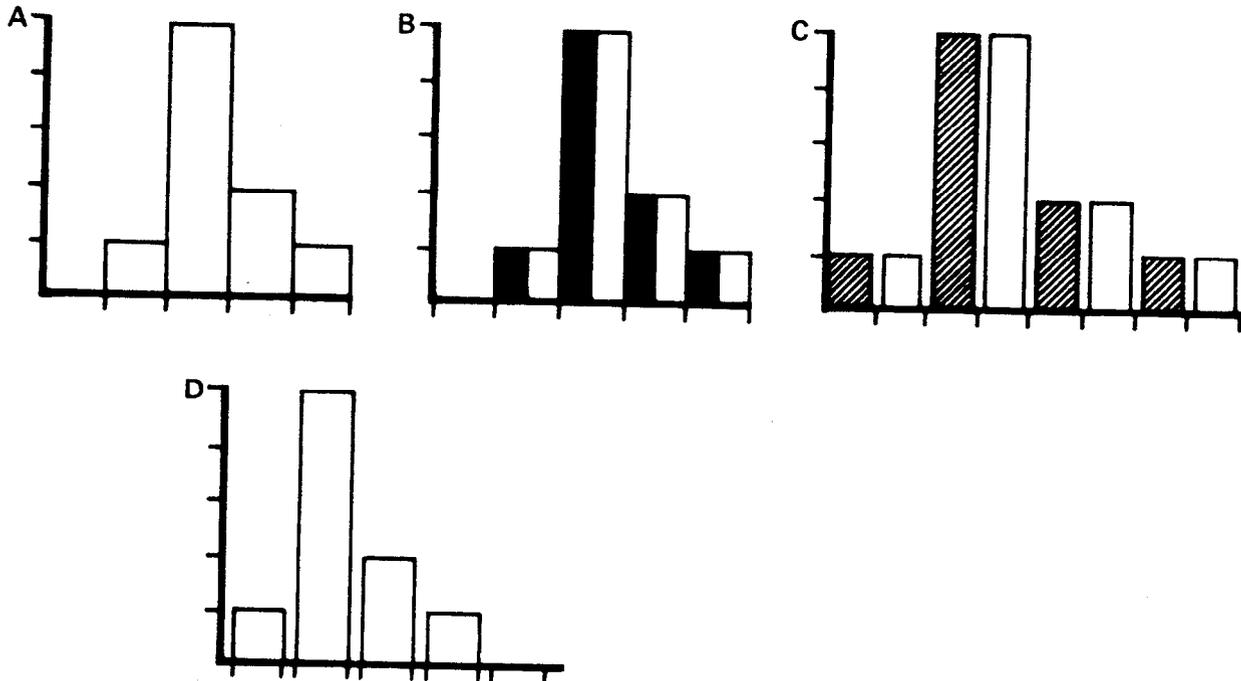
This table would be referred to as a:

- A. Race and sex table.
 - B. Twelve-column table.
 - C. Disease "x" table.
 - D. Three-variable table.
6. The main distinction between an arithmetic and semi-logarithmic scale line graph is that the arithmetic scale:
- A. Measures the rate of change between successive points on a graph.
 - B. Is preferred when the range of values to be graphed is very large.
 - C. Uses equal distances on each axis to represent equal quantities.
 - D. Is the best method of showing changes in the magnitude of numbers.

7. Which of the following sets of values would be inappropriate for identifying equidistant intervals on the y-axis of a semi-logarithmic scale line graph?
- A. 1, 10, 100, 1,000
 - B. 10, 20, 30, 40
 - C. 7, 70, 700, 7,000
 - D. 0.3, 3.0, 30, 300
8. Bar charts may be distinguished from histograms at a glance since:
- A. Bar charts are not used for time series data.
 - B. Histograms are used to display discrete data.
 - C. Bar charts are based on area under the curve.
 - E. Bar charts always have spaces between cells.
9. Regarding the area characteristic, a frequency polygon most resembles:
- A. A bar chart.
 - B. A component bar chart.
 - C. A histogram.
 - D. A semi-logarithmic scale line graph.
10. Which one of the following methods of closing a frequency polygon on the horizontal axis is correct?



11. Which one of the following best illustrates the proper construction of a bar chart?



Using the decision guide (page 33 in the reference manual) identify the recommended method of illustrating data having the characteristics described in questions 12-15.

12. You want to compare three sets of data regarding cases in an outbreak, over time.
- Bar chart
 - Histogram
 - Frequency polygon
 - Semi-logarithmic scale line graph
13. You want to compare the magnitude of events which have occurred in different places, but no map is available.
- Bar chart
 - Histogram
 - Frequency polygon
 - Arithmetic scale line graph

14. You wish to show time series data not related to an outbreak. It is important to show comparisons of rates of change.

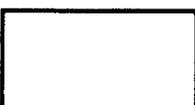
- A. Histogram
- B. Frequency polygon
- C. Arithmetic scale line graph
- D. Semi-logarithmic scale line graph

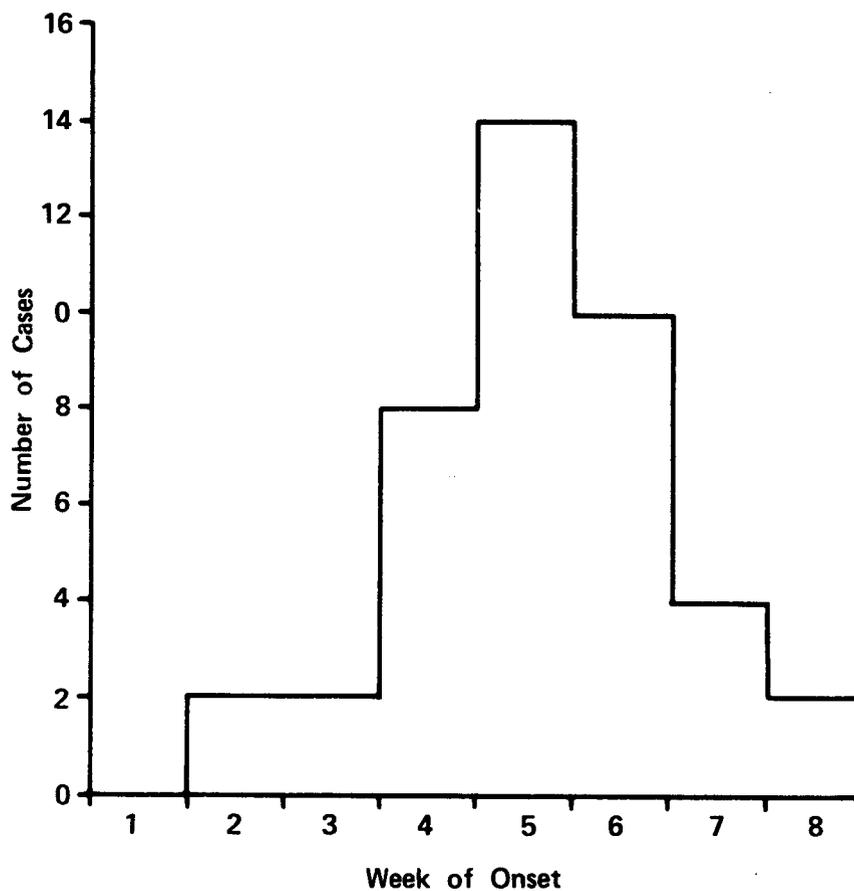
15. You want to show the distribution of cases in an outbreak over time.

- A. Bar chart
- B. Histogram
- C. Semi-logarithmic scale line graph
- D. Arithmetic scale line graph

16. Which one(s) of the following legends is correct for the histogram shown?

LEGENDS

- A.  = 1 Case
- B.  = 1 Case
- C.  = 2 Cases
- D. "B" and "C" above



Questions 17-20 are based on these five illustrations (A-D). Select the illustration which best represents:

17. A bar chart.

- A.
- B.
- C.
- D.

18. A histogram.

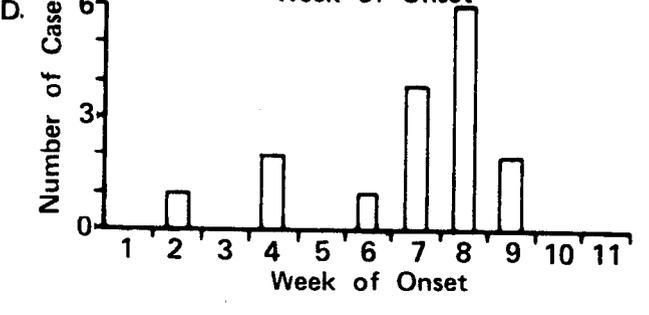
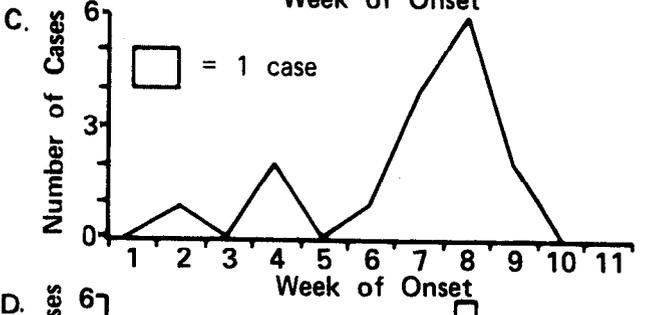
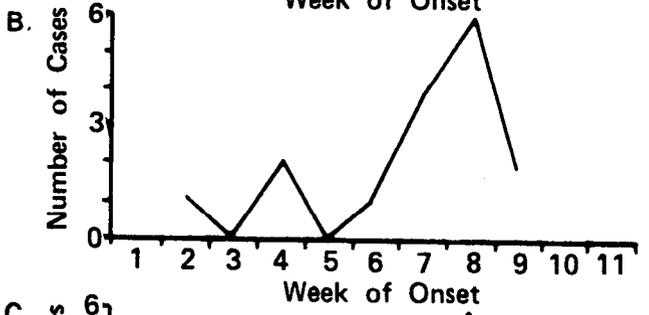
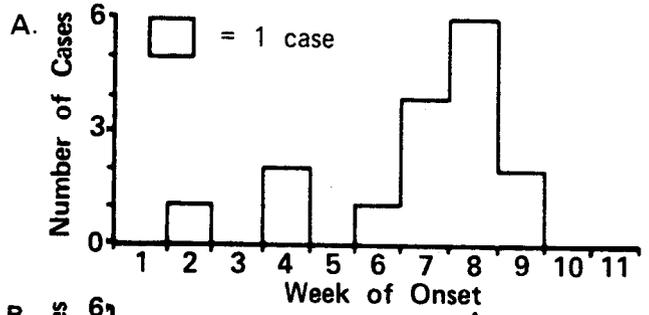
- A.
- B.
- C.
- D.

19. An arithmetic scale line graph.

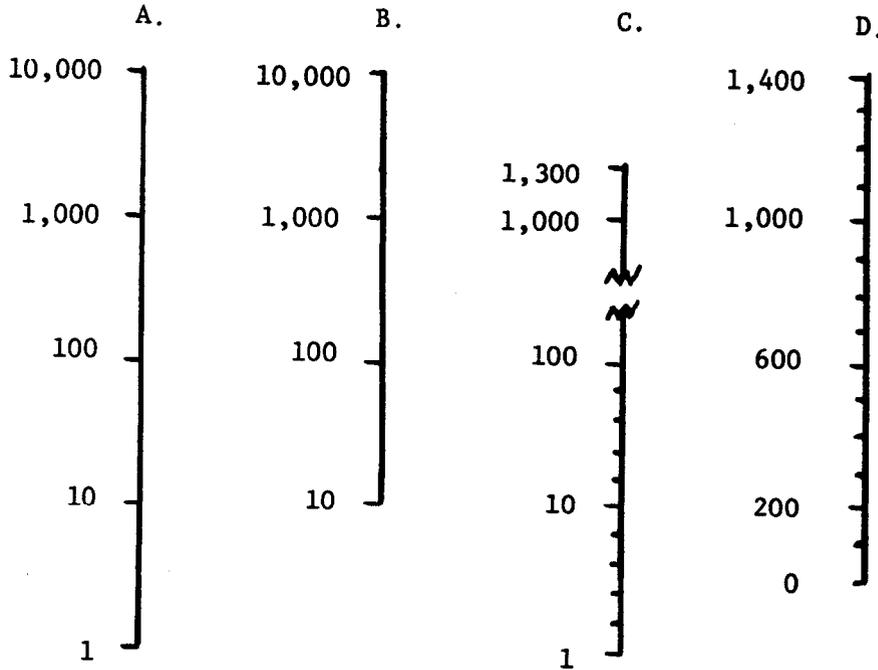
- A.
- B.
- C.
- D.

20. A frequency polygon.

- A.
- B.
- C.
- D.



21. You are preparing a scale line graph to better visualize the rate of change in the annual incidence of 3 diseases for a period of 10 years. The minimum value to be graphed for any disease or year is 17, and the maximum is 1,212. Which one of the following scales would you most likely select for the y-axis?



22. If the minimum and maximum values in question #21 were 6 and 1,400, respectively, which scale would you use?
- A.
 B.
 C.
 D.
23. If the minimum and maximum values in question #21 were 300 and 1,100, respectively, and your interest was in magnitudes of numbers rather than their rate of change, which scale would you use?
- A.
 B.
 C.
 D.

24. On page 25 of the reference manual, three methods are discussed for selecting ranges of values for mapping purposes. Apply all three methods to the data below and determine which, if any, of the ranges of rates, shown in the answer list (A-D), could NOT be obtained.

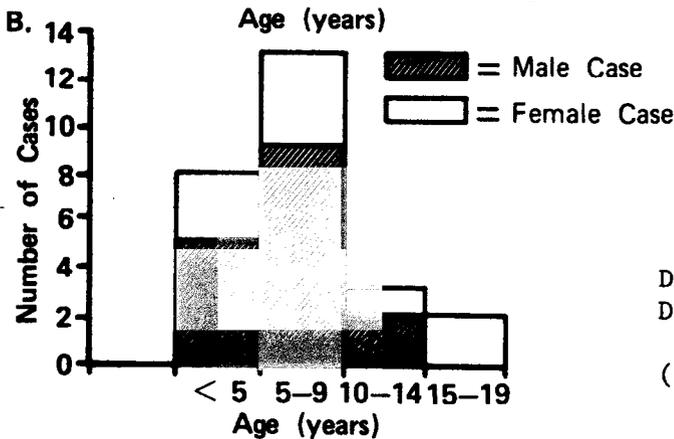
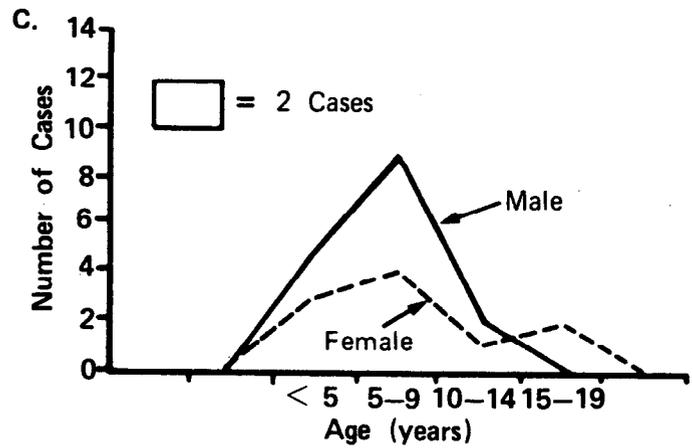
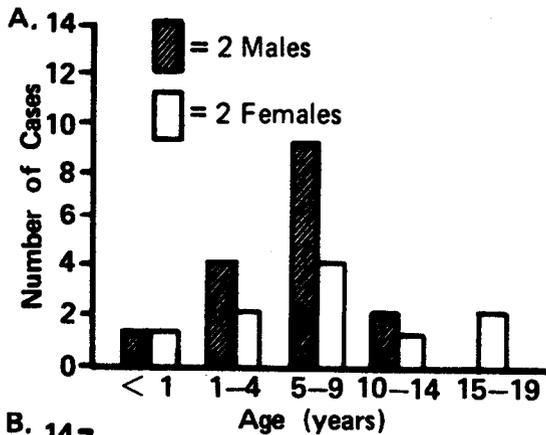
REPORTED CASES OF TUBERCULOSIS PER 100,000 POPULATION,
BY CENSUS TRACT, CITY OF DIXON, 1985

Census Tract	Number of Cases	Cases per 100,000 Population
1	3	170.5
2	0	0.0
3	2	70.0
4	1	40.0
5	4	115.5
6	1	42.1
7	4	453.5
8	0	0.0
9	1	35.1
10	1	50.3
11	0	0.0
12	0	0.0
13	5	186.4
14	2	49.9
15	3	48.9
TOTAL	27	68.0

- A. 0.0-37.6; 37.7-60.2; 60.3+
- B. 0.0-50.0; 50.1-100.0; 100.2-200.0; 200.1+
- C. 0.0-113.4; 113.5-226.8; 226.9-340.2; 340.3-453.6
- D. 0.0; 0.1-67.9; 68.0-135.9; 136.0+

25. Given the age and sex distribution of cases, as shown in the table below, which one(s) of the following illustrations, or possible answers (A-D), correctly shows the detailed information presented?

Age Group in Years	Number of Cases		
	Male	Female	Total
< 1	1	1	2
1 - 4	4	2	6
5 - 9	9	4	13
10 - 14	2	1	3
15 - 19	0	2	2
TOTAL	16	10	26



D. All the above

DHHS:PHS:CDC:TLPO
Division of Training

(FOR TRAINING PURPOSES ONLY)

PRINT OR TYPE

TITLE _____ NAVEDTRA _____

NAME _____ ADDRESS _____
 Last First Middle Street/Ship/Unit/Division, etc.

RANK/RATE _____ SOC. SEC. NO. _____ City or FPO State Zip
 DESIGNATOR ASSIGNMENT NO.

USN USNR ACTIVE INACTIVE OTHER (Specify) _____ DATE MAILED _____

SCORE

	1	2	3	4	
	T	F			
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22	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
23	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
24	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
25	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____

	1	2	3	4	
	T	F			
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27	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	_____
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	1	2	3	4	
	T	F			
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