

## Student Note Sheets

### The Case of Ms. Ima Well



**A Game of Disease Mystery Solving**

## State Health Department Response Protocol for Reports on Disease Clusters

Adapted from: Fiore, B.J., Hanrahan, L.P., and Anderson, H.A. (1990) State health department response to disease cluster reports: A protocol for investigation. American Journal of Epidemiology, 132, supplement (1), S14-S21.

Use this protocol as a guide for your investigation

Describe the Cluster

Determine geographic locations, type, number of cases, age, time period.

Verify the Cases

Obtain medical records of disease cases, death certificates.

Risk Assessment

Characterize disease group cases by age and time lived in defined region. Determine comparison population's disease rate (via state, county, zip code, or US census).

Statistically Analyze Disease Rates

Compare the disease rates of the "cluster" vs. the comparison population.

Examine Potential Exposure

Investigate environmental or occupational exposures.

Determine if the Disease is

Biologically Plausible

Does the type of disease match the exposure?

Determine Cluster Significance

Determine if this investigation merits further action. Refer to the "Cluster Significance Chart".

Report Results

Write a report on the investigation. This is kept on file and used for future reference, especially if a full investigation is done.

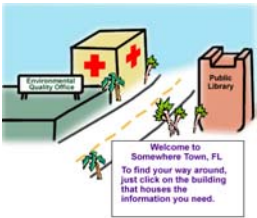
Student Name: \_\_\_\_\_ Date: \_\_\_\_\_ Class: \_\_\_\_\_

**I. Describe the Cluster:**

You can obtain information to complete this table from the introduction, the interviews, your teacher, and the website.

**A. Interviews:**

Table 1: Possible Cluster Description		
	Ms. Ima Well	Mr. Frank Leigh
Type of Disease (be specific):		
Total Number of Disease Cases Reported:		
Ages of People with Disease:		
How Long Interviewees Have Lived in the Area:		
Cluster Locations (Addresses):		
Life Style of the Interviewees: (diet/ exercise/ tobacco use/ alcohol use)		
Other Information from the Interviews:		



B. Mapping & Characterizing the Region

You can obtain this information to complete this section from the map on page 35 and from the library section/icon of the website. Additional maps can be downloaded from the website.

1. Defined time period for disease incidence: 3 years
2. Map the addresses reported in the Interview onto the Somewhere Town Map.
3. Define the Cluster Region – Defined Region is Zip Code 12345: Map the defined region onto the Somewhere Town Map. This is the 9 square miles with the northwest corner at the intersection of Howdy Road & Fairway Blvd.
4. Population Density: Locate the population density per square mile for the Defined Region. You can find the data from the library section/icon of the website; use the county census data.
5. Population of Defined Region: Calculate the number of people (population) in the Cluster Region. Population equals the population density times the number of square miles.

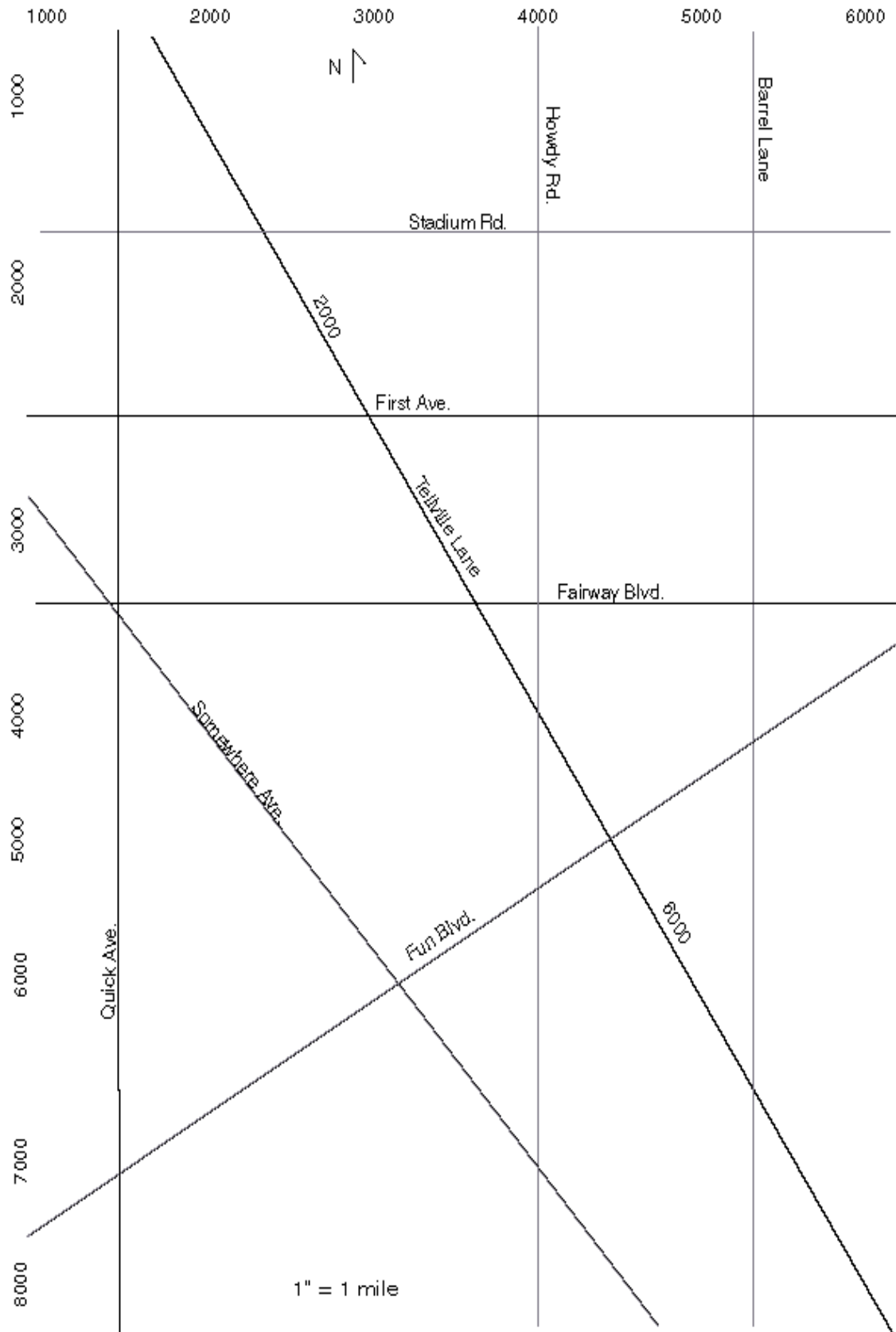


II. Verify the Cases & III. Risk Assessment

You can obtain this information to complete this table from the hospital section/icon of the website – use zip code area 12345.



Issue	Last Year	2 Years Ago	3 Years Ago	Total
Number of Cases in Defined Region (Zip Code 12345)				
Average Age				
Age Range				
Average Time Lived in Defined Region				
Range of Times Lived in Defined Region				



**IV. Statistically Analyze Disease Rates**

You can obtain this information from the library section/icon of the website.

1. Find the disease incidence rates for the nation, the defined region, and Somewhere Town.



Table 3: Possible Cluster Statistics			
Statistic	National Level Sample	Somewhere Town	Defined Region (Zip Code 12345)
Total Sample Population			
Total Number of Cases Diagnosed in 3 Years			
Total Number of Cases Diagnosed Per Year (Average)			
	<i>Convert the disease incidence rates from above to ratios you can compare (e.g. per 100,000 people). Do your math a t a. &amp; b. below.</i>		
Disease Incidence Rate Per 100,000 People		a.	b.

- a. Adjusted disease incidence rate Somewhere Town: Place your answer in Table 3 above.

- b. Adjusted disease incidence rate for the Defined Region: Place your answer in Table 3 above.

## **V. Examine Potential Exposure**

You can obtain this information from the environmental quality office section/icon from the website.

1. Contamination Location: (Write down addresses and then map them)

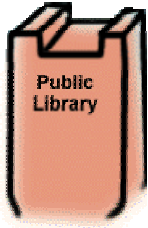
2. Types of Contaminants Present:



3. Drinking Water Quality for Defined Region:

**VI. Determine if the Disease is Biologically Plausible**

You can obtain this information from the library section/icon of the website.



1. Known Disease Risk Factors for Colon & Rectal Cancer:
  
2. Toxicological Effects of Chemicals that People in these Cases were either Exposed to or Potentially Exposed to:
  
3. Are any of the contaminants linked to the disease colon cancer? (If so, list)

**VII. Determine Cluster Significance**

You can obtain this information from analyzing your previous work.

1. Answer the following questions:

Table 4: Determination Part 1.		
	Yes	No
a. Does the cluster disease incidence rate significantly exceed the comparison population incidence rate?		
b. Was the disease population exposed to any known environmental or occupational contaminants?		
c. If an exposure did occur, is there a biological link between the disease and the contaminant?		

2. Refer to your answers to the above questions and to the “Cluster Significance Chart” below to decide if further action is recommended.

Table 4: Determination Part 2.		
	Yes	No
a. High Disease Rate		
b. Documented Exposure		
c. Biological Plausibility		
d. Further Action Recommended		

**Cluster Significance Chart**

Use this chart to help you determine if further action is needed for your investigation. If you answer “yes” to more than one of the three criteria (high disease rate, documented exposure, or biological plausibility), further action is probably needed. You may personally draw a different conclusion, which is fine, just be sure to justify your decision.

High Disease Rate +	Documented Exposure	+ Biologic Plausibility	= Further Action
Yes	Yes	Yes	Yes
Yes	No	Yes	Yes
No	Yes	Yes	Yes
Yes	Yes	No	Yes
No	No	No	No
Yes	No	No	No
No	Yes	No	No

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**VIII. Report Results (summary)**

1. In report format, write your conclusions about the presence of a disease cluster and your recommendations for further action. Justify your conclusions with the information and data you collected.

Be sure to include:

1. Total number of colon cancer cases in Ms. Well’s Zip Code (the defined region).
2. The time period for the investigation.
3. The age range of cancer patients.
4. How long the people with the colon cancer have lived in the defined region.
5. Compare cancer disease rates within the defined community with your two comparison populations. If you did a statistical analysis, discuss any statistical significance.
6. Describe any potential pollution exposures to the people in the defined region.
7. Discuss causes of colon cancer and whether any of the potential pollution exposures are biologically linked (according to our current knowledge) to colon cancer.
8. State whether you think this cluster merits further investigation and why.