

# I Left My Heart (and more) in San Francisco\*

## (Student Version)

Center for Infectious Disease Preparedness  
University of California, Berkeley  
<http://www.idready.org>

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\*This module is based on an actual field outbreak investigation. The names of involved parties have been changed. This module is for training purposes only and cannot be used for commercial gain.

## **Instructions**

This outbreak investigation is based on an actual outbreak in San Francisco in the late 1990s. It occurred at a time when public health health departments were less focused on preparing for public health emergencies from natural disasters and intentional threats. Based on what we know today, there are many aspects of this investigation we would do differently. This makes this exercise a better learning experience.

## **Learning objectives**

After completing this outbreak module, participants will be able to

1. understand the components of a public health infectious disease emergency operations response;
2. understand the components of a public health infectious disease emergency epidemiologic investigation;
3. describe the conceptual steps of conducting an outbreak investigation;
4. describe the steps of designing an outbreak analytic study;
5. describe the steps of designing a outbreak field survey;

## **For students**

Read this module and provide written answers. Use any resources at your disposal. Your instructor may have you work in groups.

## **For instructors**

This module should be facilitated by an experienced investigator and can be used in two ways:

- Use the module as a stand alone to teach the steps of conducting an outbreak investigation.
- Use the module as a follow up to a lecture on conducting an outbreak investigation.

The instructor version has our suggested answers. Feel free to adapt the answers to your audience, situation, or geography. Also, feel free to use your best answers. Make sure to tailor the training to meet the learning needs of your audience. Is your audience primarily public health nurses? public health investigators? epidemiologists? physician health officers? administrators?

Competencies represent a set of skills, knowledge, and abilities necessary to participate in or lead an epidemiologic field investigation. There are three level of competencies:

- **Aware:** Basic level of mastery of the competency. Individuals may be able to identify the concept or skill but have limited ability to perform the skill.
- **Knowledgeable:** Intermediate level of mastery of the competency. Individuals are able to apply and describe the skill.
- **Proficient:** Advanced level of mastery of the competency. Individuals are able to synthesize, critique or teach the skill.

Decide what level of competency you and your audience expect. If you have mostly non-epidemiologists, then emphasize concepts over technical details. However, if you have mostly experienced epidemiologists who are now re-tooling for outbreak investigations, then feel free to address technical details. But a word of advice: do not focus on technical details for non-epidemiologists that will never be expected to be proficient in technical areas. They are more likely to be part of an interdisciplinary investigative team: they need to understand how an outbreak investigation works, and how they can productively contribute to an investigation.

## **Feedback**

Please contact us and give us feedback and suggestions. How can we improve this module? How are you using this module?

## **Resources**

1. UC Berkeley Center for Infectious Disease Preparedness, A CDC Center for Public Health Preparedness: <http://www.idready.org>. We make most of our materials freely available online.
2. Essential Field Epidemiology Quick Reference Guide, available at <http://www.medept.net/epitools/QuickRefGuide.pdf>.
3. University of North Carolina Center for Public Health Preparedness: FOCUS on Field Epidemiology at <http://www.sph.unc.edu/nccphp/focus/>. This is an excellent newsletter and tutorial for learning about field epidemiology.
4. Centers for Disease Control and Prevention, Epidemiologic Case Studies at <http://www2a.cdc.gov/epicasestudies/>. This site contains excellent outbreak investigations modules.

# 1 The Outbreak Hotel

On Sunday, January 25, in the late 1990s, Dr. Juan Nieve, Deputy County Health Officer for the City and County of San Francisco, was at home relaxing and enjoying a very exciting National Football League Super Bowl game. During the second quarter, Dr. Nieve received a telephone call from the County Health Officer and was notified that 63 people at the Twin Peaks Hotel<sup>1</sup> had been evaluated by paramedics for nausea and vomiting. Seven patients were transported to nearby hospital emergency rooms. There were no hospitalizations and no deaths. No additional information was available at that time.

**Question 1** *If you were Dr. Nieve, what would you do at this point?*

Dr. Nieve arranged for two epidemiologists and two environmental health inspectors to meet him at the Twin Peaks Hotel that evening (at 7 pm). They met with the hotel general manager and chief of security. Here is what they learned: At 3:30 am, Sunday morning, January 25th, paramedics responded to a non-emergent call of a person ill with nausea and vomiting at the hotel. By 6:15 am, 8 additional patients were evaluated. By 1:00 pm that afternoon, paramedics evaluated 63 persons with similar complaints, many of whom required primarily medical advice. Seven patients were transported to nearby hospitals for evaluation. The hotel general manager reported that all ill persons attended the Company X Executive Forum meeting hosted at the hotel. Over 300 persons from throughout the United States attended this meeting. By Sunday evening most conference attendees that were staying in the hotel had already left San Francisco to fly home. The hotel manager outlined the course of events in the preceding 72 hours and provided access to hotel staff and remaining hotel guests, provided detailed meal information, and provided logistical support (conference room, telephones) to help launch an investigation.

**Question 2** *What would you suggest that Dr. Nieve do at this point?*

A more detailed time line of events emerged. Most attendees arrived at the conference on Thursday, January 22nd and stayed at the Twin Peaks Hotel. From Friday, January 23rd through Saturday, January 24th, they attended several common events and meals. Except for the Friday dinner meal at Restaurant A (a seafood restaurant at Fisherman's Wharf), and the Saturday dinner meal at Restaurant B (a yacht cruise ship with restaurant services), all other common meals were provided by the hotel. All apparent illnesses were only among the Company X attendees. No hotel staff (who regularly eat the same food) were reported ill. Because of the abrupt onset of symptoms that occurred only in conference attendees that shared several large-group meals, a common source food-borne exposure was strongly suspected.

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<sup>1</sup>This is a fictitious name; any resemblance to any hotel name is purely coincidental.

The epidemiologists were able to interview 12 of the 20 Company X guests still in the hotel. More than half of them reported symptoms (nausea, vomiting, and watery diarrhea). They collected information on the symptoms, time of symptom onset, and meals consumed. Several interviewees mentioned that the “food” at Restaurant B seemed “spoiled.” No stool specimens were collected. The lead environmental health inspector mentioned that Restaurant B had a history of repeated health code violations. These observations, along with the abrupt onset of illness, led investigators to suspect a short incubation food-borne bacterial toxin acquired at Restaurant B. The following timeline outlines the sequence of events understood to date:

1/22 Thursday: Attendees arrived in San Francisco and checked into Twin Peaks Hotel

1/23 Friday: 12:00 (12 pm): Lunch at Twin Peaks Hotel

1/23 Friday: 18:00 (6 pm): Dinner at Restaurant A (Seafood restaurant at Fisherman’s Wharf)

1/24 Saturday: 18:00 (6 pm): Dinner at Restaurant B (yacht & restaurant)

1/25 Sunday: From 3:30 am to 1:00 pm, 63 attendees evaluated for illness at hotel

On the evening of January 25th, environmental health inspectors visited Restaurant A and Restaurant B to obtain information regarding meals eaten by conference attendees at these establishments. The preliminary inspection at Restaurant A did not reveal any problems. The shift manager provided the inspectors with copies of the menu, meals served, information on suppliers, and time of service for the private dinner party meal in question. By the time the health inspector arrived, Restaurant B was closed for the day.

That evening, no other food-borne outbreaks were reported or detected in San Francisco. No control measures were implemented at the hotel at this time.

**Question 3** *If Restaurant B (yacht restaurant) is the source of the outbreak, what is the differential diagnosis of potential food-borne agents?*

**Question 4** *What is the primary purpose of interviewing available cases?*

**Question 5** *What important step did the investigators not do? What else might you do differently?*

On Monday, January 26th, the San Francisco Department of Public Health, Communicable Disease (CD) Control Unit launched an epidemiologic investigation, and environmental health inspectors returned to the Twin Peaks Hotel and Restaurants A and B to conduct full food service inspections. The CD Control Unit conducted an epidemiologic study.

**Question 6** *What kind of study (descriptive vs. analytic) should be conducted and why?*

**Question 7** *What study design should they use?*

**Question 8** *Describe the steps you would perform to conduct this study.*

**Question 9** *What are the threats to drawing valid conclusions and how would you address them?*

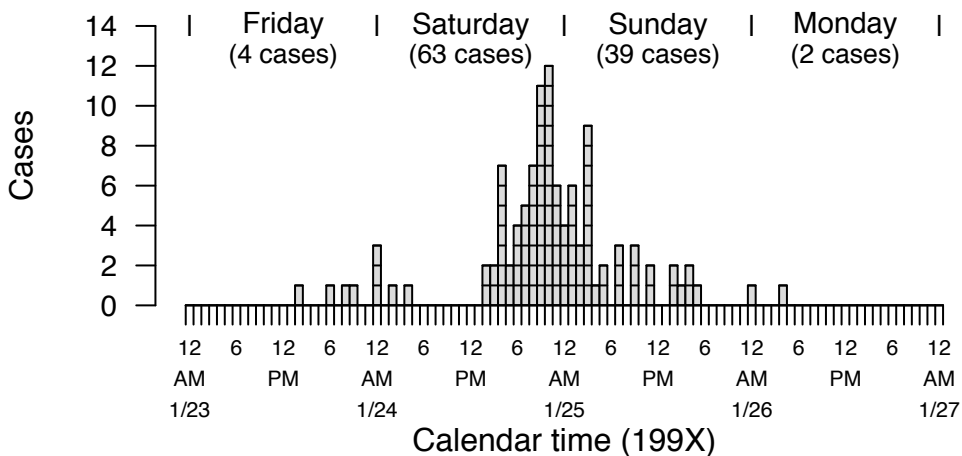


Figure 1: Outbreak of gastroenteritis at the Twin Peaks Hotel, San Francisco, California, 199X. Displayed is the distribution (histogram) of onset hour for diarrhea or vomiting for 108 cases.

## 2 The study

The CD Control Unit conducted a retrospective cohort study to identify which meal(s) and food item(s) was/were associated with the suspected foodborne illness. A survey questionnaire was designed utilizing information and food menus provided by the Twin Peaks Hotel and Restaurant A and B (see survey instrument in Appendix A on page 13). A list of 306 names and phone numbers of registered conference attendees was obtained from Company X and became the target population. The list was randomly ordered and divided into groups of twenty and assigned to interviewers (the target population became the intended sample). From Tuesday, January 27th through Wednesday, January 28th, as many attendees as feasible were contacted by interviewers without any knowledge of their symptoms or meal or food item exposures. Attendees were questioned about specific meals, food items consumed at each meal, gastrointestinal symptoms during this period, and the occurrence of potential secondary cases among household contacts after their return home. A case was defined as anyone that reported the occurrence of vomiting and/or diarrhea during the period January 23rd to January 27th. All data were entered

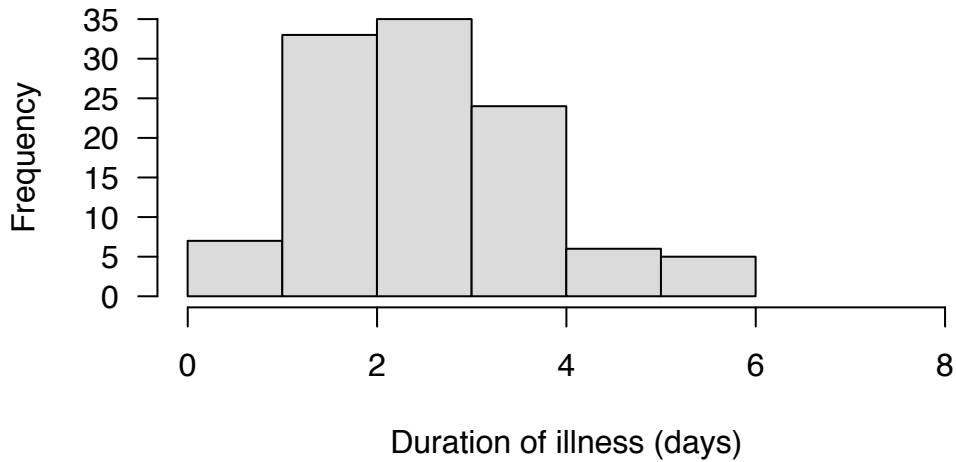


Figure 2: Outbreak of gastroenteritis at the Twin Peaks Hotel, San Francisco, California, 199X. Displayed is the distribution (histogram) of gastroenteritis symptoms (diarrhea or vomiting) for 108 cases. The median duration is 2.0 days, and the mean duration is 2.15 days.

into Epi Info 6<sup>2</sup> and exported to R<sup>3</sup> for analysis.

**Question 10** *What is the difference between target population, sample (intended sample), and respondents (actual sample) and why does it matter?*

**Question 11** *In addition, to the epidemiologic investigation, what other investigations need to occur at the same time?*

Epidemiologists completed and entered into a database interviews from 164 subjects. The case definition was met by 110 of 164 subjects (67%). The remaining 54 subjects were considered non-cases. Five cases and zero non-cases reported secondary illness among household contacts after their return.

**Question 12** *What are the general types of epidemic curves that you might see as you continue the investigation?*

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<sup>2</sup>For basic data entry we now recommend EpiData; it is freely available from <http://www.epidata.dk>

<sup>3</sup>R is an open source program for statistical computing and graphics; it is freely available at <http://www.r-project.org>.

Study the epidemic curve (Figure 1 on page 7) and duration of symptoms (Figure 2 on the previous page).

**Question 13** *What is your interpretation?*

**Question 14** *What additional information do you need to appropriately interpret the curve?*

**Question 15** *Based on Figure 2 on the preceding page, why do the median duration and mean duration of symptoms differ?*

In this outbreak investigation, the epidemiologists designed and conducted an interviewer-administered questionnaire (IAQ).

**Question 16** *What are some key steps in developing and implementing a survey questionnaire?*

Study the IAQ that starts in Appendix A on page 13.

**Question 17** *Why did the investigators put the outcome assessment questions at the end of the survey?*

**Question 18** *Who should conduct the interviews?*

**Question 19** *How would a self-administered questionnaire (SAQ) differ?*

**Question 20** *What is the case definition and how could you improve it's sensitivity and specificity? What are the trade-offs?*

**Question 21** *Based on the results of this survey, how many of the the 306 conference attendees became ill during this period? Discuss the types of biases that would affect this estimated number.*

**Question 22** *Calculate the risk ratios and the odds ratios for Table 1 on the next page and interpret your findings.*

**Question 23** *Which meal is likely implicated?*

**Question 24** *Why do the risk ratios and odds ratios differ?*

**Question 25** *Which measure of association do you prefer and why?*

**Question 26** *How would these findings now direct the field investigation?*

Table 1: Meal-specific attack percent (AP) for persons who ate at the Company X conference meals

Meal	Ate item			Did not eat item			RR	OR	P value
	Cases	Total	AP	Cases	Total	AP			
Friday (1/23)									
Breakfast	88	122	72.1	22	41	53.7	---	---	0.0349
Lunch <sup>a</sup>	109	146	74.7	0	17	0.0	---	---	< 0.0001
Dinner <sup>b</sup>	94	138	68.1	16	26	61.5	---	---	0.5045
Saturday (1/24)									
Breakfast	87	123	70.7	23	41	56.1	---	---	0.0889
Lunch	65	88	73.8	45	76	59.2	---	---	0.0664
Dinner <sup>c</sup>	86	124	69.4	24	40	60.0	---	---	0.3337

AP = attack percent; RR = risk ratio; OR = odds ratio.

All p values calculated using Fisher's Exact Test.

<sup>a</sup> 0.5 added to all cells to calculate RR and OR

<sup>b</sup> Dinner served at Restaurant A

<sup>c</sup> Dinner served at Restaurant B

Based on your analysis of Table 1, you have decided to analyze the data from Table 2 on the next page.

**Question 27** Calculate the risk ratios and the odds ratios for Table 2 on the following page and interpret your findings. Which food item might be implicated? How would these findings now direct the field investigation?

**Question 28** Based on the likely time of exposure (from analysis of Table 1), type and duration of symptoms (Figure 2 on page 8), the symptoms summarized in Table 3 on the next page and Table 4 on page 12, and the occurrence of secondary cases, re-interpret the epidemic curve. What is the likely microbial agent of this outbreak? Explain your rationale. How would this direct your investigation?

Table 2: Food item-specific attack percent (AP) for person who ate at hotel lunch on Friday, January 23rd

Food item	Ate item			Did not eat item			RR	OR	P value
	Cases	Total	AP	Cases	Total	AP			
Mixed green salad	103	140	73.5	5	5	100.0	—	—	0.3291
Ranch dressing	47	60	78.3	48	68	70.6	—	—	0.4184
Vinaigrette dressing	54	72	75.0	46	64	71.2	—	—	0.7013
Beef lasagna	104	137	75.9	5	8	62.5	—	—	0.4101
Seasonal vegetables	87	116	75.0	16	23	69.6	—	—	0.6070
Sourdough rolls	66	88	75.0	41	54	75.9	—	—	1.0000
Dutch crunch rolls	39	46	84.8	66	93	71.0	—	—	0.0941
Lemon custard tart <sup>a</sup>	103	127	81.1	5	18	27.8	—	—	< 0.0001
Unbottled water	95	125	76.0	10	17	58.8	—	—	0.1464

AP = attack percent; RR = risk ratio; OR = odds ratio.

All p values calculated using Fisher's Exact Test.

<sup>a</sup> Garnish and mixed berry coulis

Table 3: Comparison of symptoms for those that ate and did not eat lunch, Friday, January 23rd

Symptom	Ate lunch			Did not eat lunch		
	Yes	Total	(%)	Yes	Total	(%)
Nausea	111	145	76.6	0	17	0.0
Vomiting	76	144	52.8	0	17	0.0
Abdominal cramps	96	144	66.7	3	17	17.6
Diarrhea	89	144	61.8	0	17	0.0
Fevers	70	133	52.6	0	17	0.0
Chills	85	143	59.4	1	17	5.9
Lightheadedness	84	143	58.7	1	17	5.9
Bloating	61	137	44.5	2	17	11.8
Bodyaches	87	144	60.4	1	17	5.9
Headaches	84	142	59.2	1	17	5.9

Table 4: Comparison of symptoms for those that ate and did not eat the lemon custard tart, Friday, January 23rd

Symptom	Ate tart			Did not eat tart		
	Yes	Total	AP	Yes	Total	AP
Nausea	109	126	86.5	1	17	5.6
Vomiting	73	125	58.4	2	18	11.1
Abdominal cramps	94	125	75.2	1	17	5.6
Diarrhea	85	125	68.0	3	18	16.7
Fevers	68	114	59.6	1	17	5.6
Chills	83	124	66.9	1	17	5.6
Lightheadedness	84	125	67.2	0	18	0.0
Bloating	57	118	48.3	3	18	16.7
Bodyaches	84	125	67.2	2	16	11.1
Headaches	82	123	66.7	1	18	5.6

## **Appendix A: Survey Instrument**

The actual survey used for this outbreak investigation starts on the next page.

## Outbreak Exposure and Outcome Survey

Assigned ID: \_\_\_\_\_

First Name: \_\_\_\_\_ Last Name: \_\_\_\_\_

Work Phone: \_\_\_\_\_ Home Phone: \_\_\_\_\_

### **Exposure assessment**

Hello, may I speak to (name) \_\_\_\_\_. My name is \_\_\_\_\_. I am calling you from the San Francisco Health Department because you attended a conference in San Francisco organized by Company X. As you probably know, several people became ill with gastrointestinal symptoms while at the conference. The Health Department is trying to determine the source of the problem. I am interested in speaking with you whether or not you became ill at any time during or after the conference. All of this information will be kept confidential.

To begin, I would like to verify your name and address:

READ NAME AND ADDRESS TO RESPONDENT. THEN ASK,

1. Were you in San Francisco for the Company X conference anytime between Thursday, January 22<sup>nd</sup> and Saturday, January 24<sup>th</sup>?

1 [ ] YES      2 [ ] NO →→ **STOP AND THANK INTERVIEWEE**

2. a) Is there anyone else who came with you who may not have been listed on the conference participant list?

1 [ ] YES      2 [ ] NO



- b) Could you please give me the name and phone number of each person?

\_\_\_\_\_  
Name

\_\_\_\_\_  
Phone numbers

\_\_\_\_\_  
Name

\_\_\_\_\_  
Phone numbers

7 [ ] REFUSED

3. a) Did you stay at the Twin Peaks Hotel at anytime from Thursday, January 22<sup>nd</sup> to Sunday, January 25<sup>th</sup>.

2 [ ] NO            1 [ ] YES



- b) Did you stay in your own home?

1 [ ] YES

2 [ ] NO

4. On what date did you first come to the conference?

1 [ ] EARLIER THAN THURSDAY, JANUARY 22

2 [ ] THURSDAY, JANUARY 22

3 [ ] FRIDAY, JANUARY 23

4 [ ] SATURDAY, JANUARY 24

5 [ ] SUNDAY, JANUARY 25

8 [ ] DON'T KNOW or DON'T REMEMBER

5. On what date did you leave the conference?

1 [ ] EARLIER THAN FRIDAY, JANUARY 23

2 [ ] FRIDAY, JANUARY 23

3 [ ] SATURDAY, JANUARY 24

4 [ ] SUNDAY, JANUARY 25

5 [ ] AFTER SUNDAY, JANUARY 25

8 [ ] DON'T KNOW or DON'T REMEMBER

In the next section, I am going to ask you about meals that were served to a large number conference participants on Friday, January 23<sup>rd</sup> and Saturday, January 24<sup>th</sup>. Later, I will ask you about whether or not you had symptoms. For each meal you went to, I will ask you about specific foods that you might have eaten.

6. a) Did you eat breakfast at the Twin Peaks Hotel on Friday, January 23<sup>rd</sup>?

1 [ ] YES

2 [ ] NO →→→ **GO TO QUESTION 7**



b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i>Food/Beverage</i>	<i>YES</i>	<i>NO</i>	<i>DON'T REMEMBER</i>
Orange juice	1 [ ]	2 [ ]	8 [ ]
Grapefruit juice	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (cantalope)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (watermelon)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (pineapple)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (strawberries)	1 [ ]	2 [ ]	8 [ ]
Plain yogurt	1 [ ]	2 [ ]	8 [ ]
Fruit yogurt with berries	1 [ ]	2 [ ]	8 [ ]
Granola	1 [ ]	2 [ ]	8 [ ]
Scrambled eggs	1 [ ]	2 [ ]	8 [ ]
Salsa for eggs	1 [ ]	2 [ ]	8 [ ]
Bacon	1 [ ]	2 [ ]	8 [ ]
Sausage links	1 [ ]	2 [ ]	8 [ ]
Griddle potatoes with peppers and onions	1 [ ]	2 [ ]	8 [ ]
Croissant	1 [ ]	2 [ ]	8 [ ]
Danish	1 [ ]	2 [ ]	8 [ ]
Fruit and nut muffins	1 [ ]	2 [ ]	8 [ ]
Warm grits	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Other _____	1 [ ]	2 [ ]	8 [ ]

7. a) Did you eat lunch at the Twin Peaks Hotel on Friday, January 23<sup>rd</sup>?

1 [ ] YES

2 [ ] NO →→→ **GO TO QUESTION 8**



b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i>Food/Beverage</i>	<i>YES</i>	<i>NO</i>	<i>DON'T REMEMBER</i>
Green salad	1 [ ]	2 [ ]	8 [ ]
Ranch dressing	1 [ ]	2 [ ]	8 [ ]
Vinaigrette dressing	1 [ ]	2 [ ]	8 [ ]
Beef lasagna	1 [ ]	2 [ ]	8 [ ]
Vegetables	1 [ ]	2 [ ]	8 [ ]
Sourdough rolls	1 [ ]	2 [ ]	8 [ ]
Dutch crunch rolls	1 [ ]	2 [ ]	8 [ ]
Lemon custard tart with fresh fruit garnish and mixed berry coulis	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Other _____	1 [ ]	2 [ ]	8 [ ]

8. a) Did you eat dinner at Restaurant A on Friday, January 23<sup>rd</sup>?

1 [ ] YES



2 [ ] NO →→→ **GO TO QUESTION 9**

b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i><b>Food/Beverage</b></i>	<i><b>YES</b></i>	<i><b>NO</b></i>	<i><b>DON'T REMEMBER</b></i>
Grilled marinated vegetables	1 [ ]	2 [ ]	8 [ ]
Olives	1 [ ]	2 [ ]	8 [ ]
Sharp cheeses	1 [ ]	2 [ ]	8 [ ]
Asparagus spears	1 [ ]	2 [ ]	8 [ ]
Yellow and green squash	1 [ ]	2 [ ]	8 [ ]
Artichoke hearts	1 [ ]	2 [ ]	8 [ ]
Pepperoni (small, sweet pepper)	1 [ ]	2 [ ]	8 [ ]
Herb aioli (dip)	1 [ ]	2 [ ]	8 [ ]
Mixed salad	1 [ ]	2 [ ]	8 [ ]
Herb vinaigrette (salad dressing)	1 [ ]	2 [ ]	8 [ ]
Filet of Salmon with Chive Beurre Blanc	1 [ ]	2 [ ]	8 [ ]
Petite Filet Mignon with Cabernet Demi Glaze	1 [ ]	2 [ ]	8 [ ]
Herb roasted potatoes	1 [ ]	2 [ ]	8 [ ]
Vegetables served with entree	1 [ ]	2 [ ]	8 [ ]
Sourdough bread	1 [ ]	2 [ ]	8 [ ]
Butter	1 [ ]	2 [ ]	8 [ ]
Ice cream	1 [ ]	2 [ ]	8 [ ]
Berry puree (ice cream sauce)	1 [ ]	2 [ ]	8 [ ]
Waffle bowl (contained ice cream)	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Other _____	1 [ ]	2 [ ]	8 [ ]

9. a) Did you eat breakfast at the Twin Peaks Hotel on Saturday, January 24<sup>th</sup>?

1 [ ] YES



2 [ ] NO →→→ **GO TO QUESTION 10**

b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i>Food/Beverage</i>	<i>YES</i>	<i>NO</i>	<i>DON'T REMEMBER</i>
Orange juice	1 [ ]	2 [ ]	8 [ ]
Grapefruit juice	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (cantalope)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (watermelon)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (pineapple)	1 [ ]	2 [ ]	8 [ ]
Sliced seasonal fruit (strawberries)	1 [ ]	2 [ ]	8 [ ]
Plain yogurt	1 [ ]	2 [ ]	8 [ ]
Fruit yogurt with berries	1 [ ]	2 [ ]	8 [ ]
Granola	1 [ ]	2 [ ]	8 [ ]
Scrambled eggs	1 [ ]	2 [ ]	8 [ ]
Bacon	1 [ ]	2 [ ]	8 [ ]
Sausage links	1 [ ]	2 [ ]	8 [ ]
Griddle potatoes with peppers and onions	1 [ ]	2 [ ]	8 [ ]
Croissant	1 [ ]	2 [ ]	8 [ ]
Danish	1 [ ]	2 [ ]	8 [ ]
Fruit and nut muffins	1 [ ]	2 [ ]	8 [ ]
Warm grits	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Other _____	1 [ ]	2 [ ]	8 [ ]

10.a) Did you eat lunch at the Twin Peaks Hotel on Saturday, January 24<sup>th</sup>?

1 [ ] YES



2 [ ] NO →→→ **GO TO QUESTION 11**

b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i><b>Food/Beverage</b></i>	<i><b>YES</b></i>	<i><b>NO</b></i>	<i><b>DON'T REMEMBER</b></i>
Minestrone soup	1 [ ]	2 [ ]	8 [ ]
Grilled chicken	1 [ ]	2 [ ]	8 [ ]
Caesar salad	1 [ ]	2 [ ]	8 [ ]
Sourdough rolls	1 [ ]	2 [ ]	8 [ ]
Dutch crunch rolls	1 [ ]	2 [ ]	8 [ ]
Chocolates	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Other _____	1 [ ]	2 [ ]	8 [ ]

11.a) Did you eat dinner on the Restaurant B Cruise on Saturday, January 24<sup>th</sup>?

1 [ ] YES



2 [ ] NO →→→ **GO TO QUESTION 12**

b) I am going to read you a list of foods that were served at that meal. For each food, tell me whether or not you ate that food.

<i><b>Food/Beverage</b></i>	<i><b>YES</b></i>	<i><b>NO</b></i>	<i><b>DON'T REMEMBER</b></i>
Sirloin of Beef	1 [ ]	2 [ ]	8 [ ]
Horseradish sauce	1 [ ]	2 [ ]	8 [ ]
Grilled chicken breast	1 [ ]	2 [ ]	8 [ ]
Steamed vegetables	1 [ ]	2 [ ]	8 [ ]
Rice pilaf	1 [ ]	2 [ ]	8 [ ]
Caesar salad	1 [ ]	2 [ ]	8 [ ]
Marinated mushroom salad	1 [ ]	2 [ ]	8 [ ]
Rolls	1 [ ]	2 [ ]	8 [ ]
Tartlettes	1 [ ]	2 [ ]	8 [ ]
Water (not bottled)	1 [ ]	2 [ ]	8 [ ]
# Glasses of water _____			
Champagne	1 [ ]	2 [ ]	8 [ ]
Other _____	1 [ ]	2 [ ]	8 [ ]

**Outcome assessment**

12.a) Did you have any gastrointestinal symptoms or feel ill at any time between Friday, January 23<sup>rd</sup> and Tuesday, January 27<sup>th</sup>?

1 [ ] YES



2 [ ] NO →→→ **GO TO QUESTION 18**

b) Now I am going to ask if you had any of the following symptoms while you were feeling ill.

<b>Symptom</b>	<b>YES</b>	<b>NO</b>	<b>DK</b>
Nausea	1 [ ]	2 [ ]	8 [ ]
Vomiting	1 [ ]	2 [ ]	8 [ ]
Abdominal cramps	1 [ ]	2 [ ]	8 [ ]
Diarrhea	1 [ ]	2 [ ]	8 [ ]
Fever	1 [ ]	2 [ ]	8 [ ]
Chills	1 [ ]	2 [ ]	8 [ ]
Lightheadedness	1 [ ]	2 [ ]	8 [ ]
Bloating	1 [ ]	2 [ ]	8 [ ]
Body aches	1 [ ]	2 [ ]	8 [ ]
Headaches	1 [ ]	2 [ ]	8 [ ]
Other: _____	1 [ ]	2 [ ]	8 [ ]

13. When did you first start feeling ill?

Day \_\_\_\_\_ (SAT, SUN, MON, TUE)

Date \_\_\_\_\_ (1/24, 1/25, 1/26, 1/27)

Time \_\_\_\_\_ (AM, PM)

14.a) What was the first symptom you had? \_\_\_\_\_

First Symptom

b) (IF FIRST SYMPTOM WAS NOT NAUSEA, DIARRHEA, OR VOMITING),  
When did you begin having nausea, diarrhea or vomiting?

Day \_\_\_\_\_ (SAT, SUN, MON, TUE)

Date \_\_\_\_\_ (1/24, 1/25, 1/26, 1/27)

Time \_\_\_\_\_ (AM, PM)

15. How many days were you ill? \_\_\_\_\_  
#Days

16.a) Did you seek medical help?

1 [ ] YES

2 [ ] NO

↓  
↓

b) When? \_\_\_\_\_

c) Where? \_\_\_\_\_ (NAME & PHONE)

17.a) Have any household contacts become ill with similar symptoms?

1 [ ] YES

2 [ ] NO

↓  
↓

b) When? \_\_\_\_\_

c) Where? \_\_\_\_\_ (NAME & PHONE)

18. So that we may contact you later, may we have your home address and phone number?

\_\_\_\_\_  
Street number                      Street

\_\_\_\_\_  
City                      State/Country                      ZIP code

Home phone \_\_\_\_\_

**INTERVIEWER: PLEASE NOTE THE HOME PHONE NUMBER ON THE FIRST PAGE**