

QWA

by Fgh Dfg

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Outbreak Investigation (Updated)

You have been called in by Mammoth Lake's health department to investigate a local summer camp called Camp Mammoth Lake. Some of the campers have become ill with gastrointestinal (GI) symptoms, including diarrhea, abdominal cramps, muscle pain, fever, nausea, and vomiting. The counselors noted that the first child becomes ill on July 1. Unfortunately, those with signs and symptoms were sent home from the camp and stool samples were not obtained (unfortunately for you, the epidemiologist, as this would've helped in identifying the agent underlying disease). Instead, you are left with descriptive epidemiology to identify the source; you call ill campers at their homes to obtain the necessary information and visit the camp to conduct face-to-face interviews with healthy camp attendees (1 control for per case). At this point, you conduct your interviews and fill out your outbreak investigation handout (line listing). Again, you are only able to get a hold of 10 ill campers and interview 1 control per case at the camp. Reminder: only cases will have information on signs/symptoms and disease onset. Symptomatic cases include persons with at least one specific gastrointestinal symptoms; fever, vomiting, and diarrhea(Nausea does not mean vomiting). Answer each question thoroughly.

1. Before beginning the investigation, what do you think might be causing the illness in these campers?

The illness in the campers at Camp Mammoth Lake is likely to be caused by low sanitation levels at the camp. Hygienic standards at the camp are not adequately observed. The symptoms that most ill campers have had are an indication of a probable illness that is caused by germs. This may be as a result of drinking contaminated water or taking in dirty food.

2. What is your case definition for the outbreak investigation? (Person, Place, Time, and Symptoms)

The case definition for this outbreak investigation is categorized as confirmed. The investigation on a confirmed food illness in campers at Camp Mammoth Lake in July with the deceased experiences symptoms such as abdominal cramps, muscle pain, fever, nausea, diarrhea, and vomiting.

3. Why would you want to interview both cases and controls?

Interviewing both these cases and controls simultaneously would be an effective method of teaching the campers a lot on the possible causes of the outbreak in the camp. They explain their cases, and you give them an insight into what they need to do to avoid future outbreaks. One states the kind of water and meals he uses. Generally, the hygienic standards of the camp and the interviewer gets to advise them to avoid near future outbreaks with the same causes.

4. Calculate the attack rates (ARs) and attack rate ratios (ARRs) for each food item. Note: AR is not a rate, it is a proportion expressed as a percent. It can help to identify possible sources of an outbreak (whether activity- or food-related); the higher the AR, the more likely this is a source of exposure to the agent in question. The AR is essentially the same calculation as cumulative incidence or risk (take the total number of cases that ate the food item divided by all those that ate the food item, which includes exposed cases and controls); ARs are calculated for each food item, individually.

$$\text{Attack Rate (AR)} = \frac{\# \text{ of cases of GI that ate the specific food item}}{\# \text{ people that ate the specific food item}} \times 100$$

$$\text{Attack Rate Ratio (ARR)} = \frac{\text{Attack Rate in the EXPOSED}}{\text{Attack Rate in the UN - EXPOSED}}$$

$$\text{AR} = 7/20 \times 100 = 35\% \text{ for chips.}$$

Subject (name)	July 1 (Only focus on the food eaten on July 1 st We are assuming the exposure was on this day)																Signs & symptoms (for all days) (Hint: nausea is NOT vomiting)						
	Breakfast					Lunch						Dinner											
	Eggs	Sausage	Oatmeal	Fruit	Juice	Grilled cheese	Egg salad	Turkey and cheese	Chips	Carrots/celery	Fruit	Brownies & ice	Tomato soup	Chicken noodle	Spaghetti	Meatballs	Garlic bread	Yellow cake	Fever	Vomiting	Diarrhea	Case?	Date & time of onset
Attack Rate Ratio Here																							
Freddy							1 X		X				X					X	X	X	X	Yes	7/1, 7:30 P
Valerie					x	x	x							x				x			Yes	30/6	
Peter			4		X	X						X						X			No	30/6	
Angela	x	x			x		x					x		x	x	x		X		X	Yes	7/2 9:30 A	

Jason	1 x	x				x				x	x	x			x		x	x	x		Yes	30/6
																					s	3.00
																						P
Miguel	1 x	x			x		x			x	x			x		x					No	
Carter							x	x					x	x	x			x		x	Yes	7/2
																					s	11.0
																						0A
Michelle			1 x		x	x					x										No	
Emily			x		x		x		x	x								x	x	x	Yes	7/2
																					s	1.O
																						OA
Haile							1 x	x		x			x		x		x	x			No	
Chris								x	x									x			No	
Rose	x		x		x		x		x						x		x		x		Yes	7/2
																					s	8.00
																						A
Marina	1 x	x			x		x	x		x	x		x				x	x		x	Yes	7/2
																					s	9.00
																						A

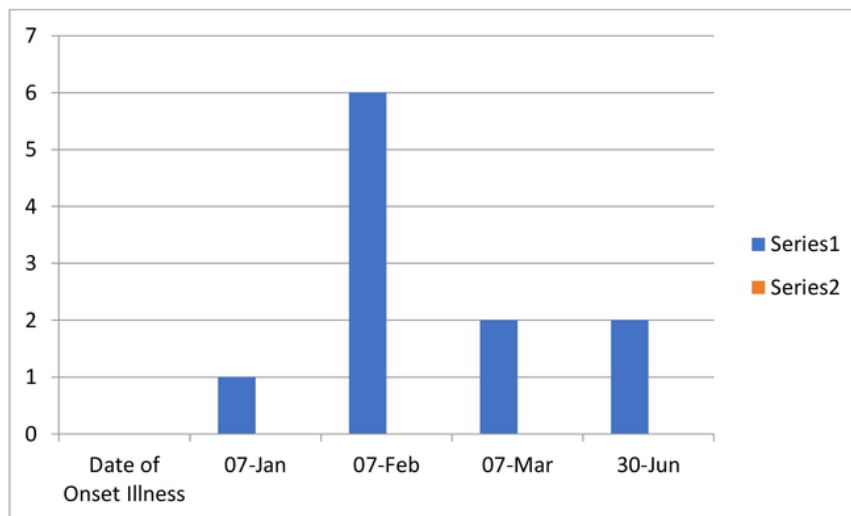
Sarah	1	X	X			X			X	X	X				X	X	X				No	
				x	x			x		x	x			x		x	x		x	Yes	7/2	
Curtis								x		x	x			x					x	s	8:30	
																				A		
Vanessa	3	X	X			X			X		X			X		X					No	
Larry				x										x		x	x				No	
Michael		x	X			X	X	X		X					X			X	X	X	Y	7/3
																				ES	3.00	
Ellen	1	X			X	X			X		X			X		X					No	
Sofia				x	x									x					x	x	Yes	7/3
																				s	12.0	
																					0P	

5. Based upon the Ars and ARRs, which food item(s) is(are) likely the cause of the outbreak? Justify your answer.

The food item that is most likely to have caused the outbreak is chips.

All the people who have been reported ill at the camp must have taken chips with other meals as well.

6. Create an epidemic curve in excel and insert it belowOnly cases are included in the curve (10 cases of GI are interviewed so you will use the last column of data from your line listing, date/time of illness onset). Because all cases show up in a matter of days, use 8-12 hour intervals for your x-axis.



7. When did the first case become sick? When did the last case become sick? What is the average incubation period?

The first camper became sick on the 1st of July.

The last case was recorded on the 3rd of July.

The incubation period of the disease causing germ is approximately 3 days.

8. Now that you identified the likely food source and agent, what would you do next?

After the identification of the food source that caused the outbreak, proper hygienic standards should be ensured in the preparation of this food. They should also ensure sanitation of the source of the food.

Subject Interviews

Subject 1:-----

(already completed on worksheet as an example)

Freddy is a 14-year-old male. Freddy was the first camper to become ill. He first reported feeling ill around 7:30PM, July 1. By 8pm that night, Freddy had a fever of 100°F. Throughout that night Freddy suffered persistent vomiting and diarrhea. He also had fever and muscle aches, which lasted for two days.

June 30:

Freddy overslept for breakfast, but woke in time for the morning canoe trip. Ten campers, including Freddy, canoed down the Crystal River from 9:00am -12:00 pm, returning in time for the 12:15pm lunch. Freddy compensated for his missed breakfast by devouring two plain hotdogs with no buns for lunch at the cafeteria. Freddy also ate fries with a side of ketchup and can of coke.

After lunch, Freddy rested in his room and played his Nintendo DS. For dinner, Freddy had two slices of cheese pizza and another can of coke. After dinner, Freddy and the rest of the campers sat by the nightly campfire and told ghost stories.

July 1:

Freddy overslept for breakfast again and almost missed the hiking trip he had planned, which began at 9:30 am. The hikers returned for lunch at 12:00 am. Freddy was famished from his long hike and ate two egg salad sandwiches with a side of BBQ favored lays chips and also finished a bottle of water. After lunch, Freddy rested in his room and then went swimming in the lake. For

dinner at 6:00pm, Freddy ate in the cafeteria. Since he was not very hungry, he took a small bowl of chicken noodle soup and a slice of yellow cake. After dinner, he returned to the campfire and chatted with fellow campers. Around 7:30pm, he started feeling very ill.

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Subject 2:-----

Valerie is a 12-year-old female. She saw the camp nurse on June 30th after dinner due to a headache and slight nausea. The nurse gave her some PeptoBismol. She woke up the next morning feeling fine.

June 30:

Valerie woke up early and read in her bed before breakfast. At breakfast she enjoyed eggs, bacon and orange juice. After breakfast, she joined some of the other campers for a canoe trip down Crystal River from 9:00 am-12:00 pm. Valerie returned in time for the 12:15pm lunch and was famished. She devoured french fries and a hotdog for lunch at the cafeteria, with a side of ketchup and a bottle of water. After lunch, Valerie went for a nature walk collecting different types of rocks. For dinner, Valerie went to the cafeteria and had a slice of pepperoni pizza and a can of soda. After dinner she went to see the camp nurse. The nurse sent her back to her cabin to get some sleep.

July 1:

Valerie woke up the next morning feeling refreshed. She grabbed some orange juice and some fruit and headed down to the lake for a swim lesson. After the lesson, she returned to her cabin for a shower and decided to hang out in her room and read. At lunch, she ate one of her favorite meals--a grilled cheese sandwich as well as a small helping of egg salad. After lunch, she headed to the craft cabin with another camper. She had been working on a painting for the past week and hoped to finish it that day. She painted until dinner and then met up with some friends in the cafeteria. She was not too hungry so she ate a small plate of spaghetti. She then headed to the campfire with the other campers until she was ready for bed.

Subject 3:-----

Peter is a 22-year-old male. He is a lifeguard at the camp. He did not report feeling ill.

June 30:

After waking up, Peter walked directly to the cafeteria for the 8:30 am breakfast. He ate a banana and had a glass of orange juice. He then walked over to the lake to watch over the campers during their swim lesson. At lunch, Peter ate a hamburger with French fries. He also had banana pudding. After lunch, he went back to his room for a short rest before returning to the lake to supervise the campers swimming. For dinner, Peter had three slices of pepperoni pizza. He also drank a coke. After dinner, Peter decided to relax with the campers at the campfire.

July 1:

At breakfast, Peter had oatmeal along with a glass of orange juice. After breakfast, Peter went down to supervise swimmers in the lake. At 11:45am, he went back to his room to shower and get ready for lunch. At lunch, Peter ate a grilled cheese sandwich and brownie with vanilla ice cream. After lunch, Peter went to hang out with his girlfriend, the arts and crafts instructor, and then went back to the lake. For dinner, Peter decided to take his girlfriend off the campgrounds to a nearby restaurant. They did return in time for the campfire with all the other campers and staff. It is not known what Peter consumed at dinner off the campgrounds but still had a slice of yellow cake later.

Subject 4:-----

Angela is a 13-year-old female. She first reported feeling ill around 9:30am on July 2, almost immediately after breakfast. Her symptoms included high fever, nausea, and persistent diarrhea.

June 30:

After waking up, Angela walked directly to the cafeteria for the 8:30 am breakfast. She ate a plate of eggs. She also ate a banana and had a glass of orange juice. She then walked over to the lake for a morning swim lesson. At 11:45AM, she went back to her room to shower for the 12:15 pm lunch. At lunch, Angela ate a hamburger with ketchup. She also had a side of fries and banana pudding. After lunch, Angela joined fellow campers for a three-hour hike. After the hike, she went back to her room for a short rest before dinner. In her room she ate a granola bar. For dinner, Angela took a slice of pepperoni pizza. She also drank a sprite. After dinner, Angela went to the campfire with the other campers.

July 1:

Angela had eggs and sausage for breakfast along with a glass of orange juice. After breakfast, Angela went down to the lake for her second swim lesson. At 11:45 am she went back to her room to shower and get ready for lunch. At lunch, Angela ate an egg salad sandwich and had a brownie with vanilla ice cream. After lunch, Angela went to the craft cabin to paint pottery. After finishing in the craft cabin, Angela went to the lake with some friends and read. For dinner, Angela had a large bowl of spaghetti with meatballs and a slice of garlic bread. She also had a slice of yellow cake. She then went down to the campfire with all the other campers.

Subject 5:-----

Jason is a 15-year-old male and the last camper known to become ill. He first reported feeling ill around 3:00 pm July 3. His symptoms included fever, nausea, vomiting and diarrhea.

June 30:

Jason had a hearty breakfast of eggs, bacon and a glass of orange juice, and then joined his friend Freddy for a three-hour canoe trip down Crystal River. At 12:00 pm Jason headed to lunch and enjoyed two hamburgers, fries, and banana pudding.

After lunch, Jason rested in his room and finished the day with an intense swimming lesson in the lake. He was a beginning swimmer and could barely float. For dinner, Jason when back to the cafeteria and ate two slices of Sausage pizza and drank a sprite. After dinner, Jason and the rest of the campers sat by the nightly campfire and told ghost stories.

July 1:

Jason went to the cafeteria for breakfast and had a plate of eggs and sausage. He then went down to the lake for another swimming lesson. After the lesson, he went back to his cabin to shower and change for lunch. At lunch, Jason ate an egg salad sandwich and an apple. After lunch, he went on a hike with a number of other campers. The hikers returned around 4:00 pm. Jason went straight to room and fell asleep, waking up just in time for dinner. Jason ate a small bowl of tomato soup and a large plate of spaghetti with meatballs. He also ate a large slice of yellow cake. After dinner, he returned to the nightly campfire and chatted with fellow campers.

Subject 6:-----

Miguel is a 13-year-old male. He is Freddy's roommate. He did not report feeling sick.

June 30:

After waking up, Miguel went directly to the cafeteria for the 8:30 am breakfast. He ate eggs, bacon, and orange juice. After breakfast, he and fellow camper went bird watching. While watching a particularly rare bird, Miguel fell into a muddy puddle. At 11:45 am, he went back to his room to shower for the 12:15 pm lunch. For lunch, Miguel ate a veggie burger. He also had some celery sticks and some banana pudding for dessert. After lunch, Miguel joined some of the other campers for a three-hour hike. After the hike, he went back to his room for a short rest before dinner and had some of Freddy's home made peanut butter cookies. For dinner, Miguel took two slices of pepperoni pizza; he also drank a sprite. After dinner, Miguel went to the campfire with the other campers.

July 1:

Miguel had eggs and sausage for breakfast along with a glass of orange juice. After breakfast, Miguel went for a swim at the lake. At lunch, Miguel ate a turkey sandwich and had a brownie with vanilla ice cream. After lunch, Miguel went to the craft cabin to paint a ceramic vase for his mom. For dinner, Miguel had a large bowl of spaghetti, a small tomato soup, and a piece of garlic bread. He then went down to the campfire with all the other campers.

Subject 7:-----

Carter is a 13-year-old male. He first reported feeling ill around 11:00am on July 2, a couple of hours after breakfast. His symptoms included intense stomach pain, nausea, diarrhea, and a high fever, which continued for 3 days.

June 30:

Carter woke up early and took a shower before heading to breakfast. At 9:00 am, he sat down at the cafeteria and had a breakfast of eggs and bacon as well as some apple juice. Afterward, Carter went over to the lake for his morning swim lesson. Afterward, back in his cabin, he ate some home-baked peanut butter cookies that his mom had sent him in care package the day before. After listening to his iPod for a while, he headed down to the cafeteria for some lunch. He arrived at noon for lunch, and he had a hamburger with bun, French fries with ketchup, and a can of Coke. After lunch, Carter headed for his archery lesson. After an afternoon shower, Carter headed once again to the cafeteria for dinner where he had a slice of sausage pizza and bottled water. Afterward, he went to the campfire with other campers.

July 1:

Carter was so full from the previous day's meals that he decided to skip breakfast and played with his cell phone all morning. He got so distracted that he forgot about his swimming lesson. By the time he remembered, it was 11:45 am and time for lunch. When he got to the cafeteria, he couldn't decide between the egg salad sandwich and the grilled cheese, so he had one of each. He was pretty full, but he couldn't pass up his favorite dessert, brownies with vanilla ice cream. Afterward, he went swimming in the lake. He went to dinner at 6:00pm where he had a cup of chicken noodle soup along with a plate of spaghetti and meatballs and topped it off with a Mountain Dew. After dinner, he had four pieces of sour candy that he had brought from home

and he lay down to read a comic book. Around 11 am, the next morning, he began having stomach cramps and experiencing heavy diarrhea.

Subject 8:-----

Michelle is a 22-year-old female. She is the arts and crafts instructor on the campgrounds. She did not report feeling ill.

June 30:

After waking up, Michelle walked directly to the cafeteria for 8:30 am breakfast. She ate eggs, a banana, and a glass of orange juice. She then walked over to the craft cabin to teach a pottery class. At 12:30 pm, she met up with Peter for lunch and ate 2 hot dogs and drank a bottle of water. She also had banana pudding. After lunch, she spent some time talking with the other counselors. For dinner, Michelle had a slice of cheese pizza; she also drank a bottle of water. After dinner, Michelle was too tired to go the campfire, so she did some reading in her cabin for the rest of the night instead.

July 1:

The next morning, Michelle had oatmeal along with a glass of apple juice. After breakfast, Michelle left the campgrounds to purchase some art supplies, but she returned in time for lunch. While at lunch, Michelle ate a grilled cheese sandwich, as well as a brownie with vanilla ice cream. After lunch, she taught another pottery lesson. Later, Michelle left the campgrounds with Peter for dinner, but they returned in time for the campfire.

Subject 9:-----

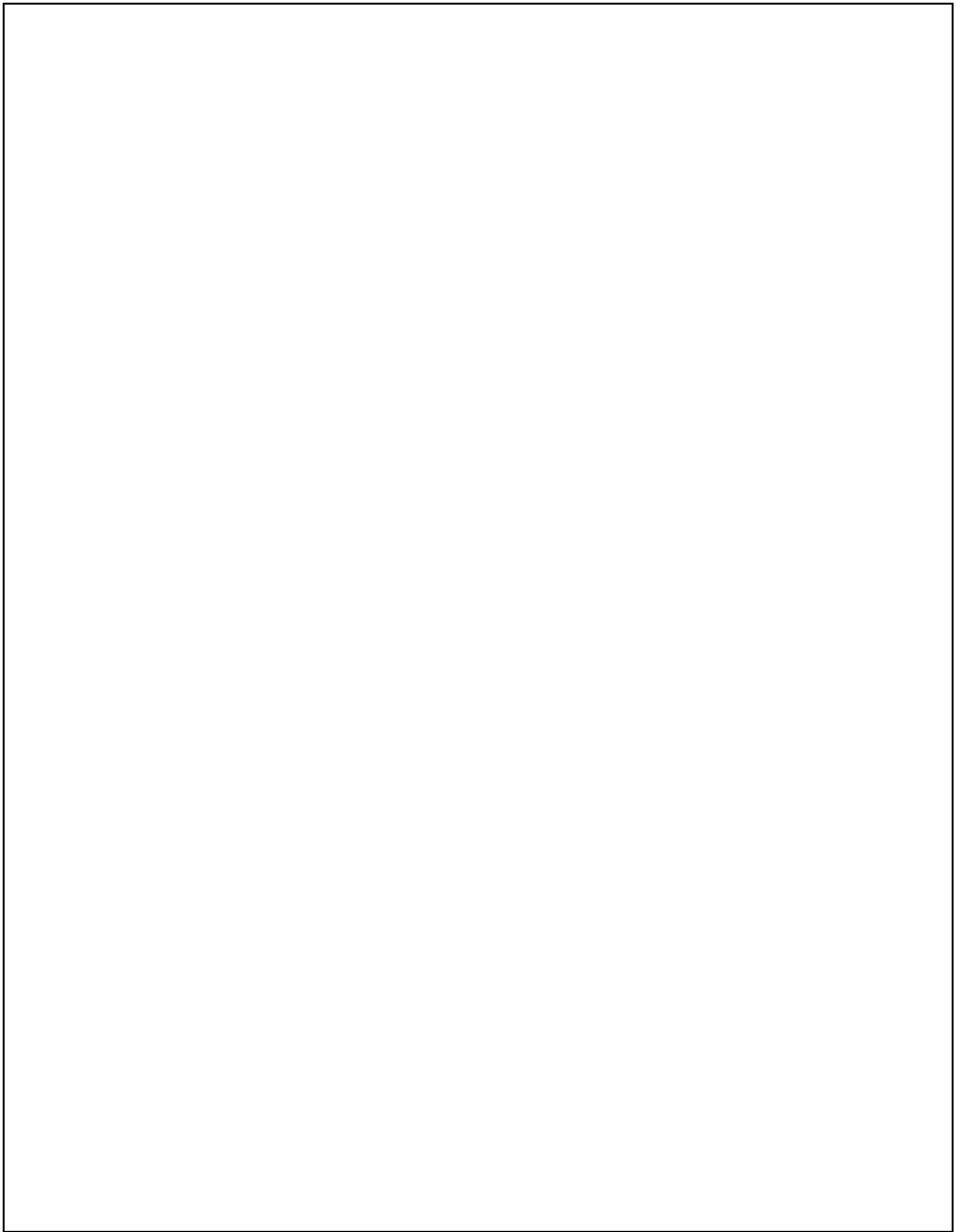
Emily is a 13-year-old female. Emily woke up in a sweat around 1 am on July 2 feeling dizzy. She tried falling asleep for about an hour. Her attempts were unsuccessful. Around 2:30am, she vomited. Later that morning, she experienced diarrhea.

June 30:

Emily woke up early and talked to her mother on the phone before showering and going to breakfast at 8:15 am. She had bacon and some orange juice. After breakfast, she went on the canoe trip with 9 other campers. Afterward, she headed to the cafeteria for lunch. She had a very full lunch, which included a hot dog with bun, carrots, and celery sticks. She also enjoyed some banana pudding, and she took some carrots from the cafeteria to enjoy later as a snack. After lunch, she decided to join many of the other campers in an afternoon hike around the lake. After the hike, she took a brief nap before heading to dinner at 6:15 pm. At dinner, she had two slices of cheese pizza, the carrots she swiped earlier, and a Coke.

July 1:

Emily had a big bowl of oatmeal along with a banana for breakfast. After breakfast, Emily decided to go for a swim in the lake. Next she read a couple of chapters of Twilight, and headed to lunch. At lunch, she had half an egg salad sandwich, two bags of BBQ chips, carrots, and a can of sprite. She also had two bites of the brownie and vanilla ice cream, but was too full to finish it. After lunch, she headed to the craft cabin to work on her pottery project. After the craft cabin, Emily met up with Carter, and he shared some of his mom's home baked peanut butter cookies with her. At dinner, Emily was so full; she just had a bowl of tomato soup and water. After dinner, she felt very tired and went straight to bed.



Subject 10:-----

Haile is 14-year-old female camper. She did not report feeling ill.

June 30:

Haile overslept for breakfast both mornings, but woke in time for the canoe trip with the other campers that went down the Crystal River from 9:00 am - 12:00 pm, returning in time for the 12:15 pm lunch. Haile ate a hamburger, French fries with a side of ketchup and can of coke. After lunch, Haile spent a few hours on the phone talking to her friends back home. For dinner, Haile went back to the cafeteria and she had a slice of cheese pizza, another can of coke, and a chocolate ice cream sandwich. After dinner, Haile joined the campers by the campfire.

July 1:

Haile overslept for breakfast again. She had a breakfast bar that she brought from home to hold her over until lunch. That morning, she hiked around the lake until lunchtime. At lunch, she had a turkey sandwich, chips, and apple wedges. She also drank a bottle of water. After lunch, she headed to the pottery lesson to work on coffee mug for her dad. At dinner, she had a small bowl of chicken noodle soup, spaghetti, two slices of garlic bread and a coke. After dinner, she joined the campers by the fire.

Subject 11:-----

Chris is a 12-year-old male camper. He did not report feeling ill.

June 30:

Chris overslept for breakfast, but woke in time for the morning for the hiking trip. Chris compensated for his missed breakfast by devouring two plain hotdogs at lunch in the cafeteria as well as one hamburger and some carrots. After lunch, Chris rested in his room and played suduko. For dinner, Chris went back to the cafeteria and had two slices of cheese pizza, another can of coke, and a chocolate ice-cream sandwich. After dinner, Chris and the rest of the campers sat by the nightly campfire and told ghost stories.

July 1:

Chris overslept for breakfast again. Once he woke up, he met up with Miguel and went for a swim in the lake. Chris was famished from not eating any breakfast and all that swimming, so he ate two turkey and cheese sandwiches with a side of BBQ favored lays chips. He also finished two bottles of water at lunchtime. After lunch, Chris rested in his room for a bit before heading to this archery lesson. For dinner at 6:00pm, Chris ate in the cafeteria; he had a small bowl of chicken noodle soup and a slice of yellow cake. After dinner, he returned to the campfire and chatted with fellow campers.

Subject 12:-----

Rosie is a 14-year-old female. She reported feeling sick for the first time around 8:00 am on July 2, before having breakfast. Her symptoms included vomiting and nausea that persisted for 3 days.

June 30:

Rosie arrived at camp around 11 am that morning after spending the weekend at home where she had celebrated her birthday at an amusement park with her family. Since she missed breakfast, she had a big lunch of 1 hotdog and 1 hamburger each with a bun. She also had a few French fries with mayonnaise and a can of diet coke. After lunch, she caught up with some campers going on a three-hour hike, and she decided to join them. After the hike, she got a little bored, so she decided to take a swim in the lake. After the swim, she took a quick shower and headed to the cafeteria for dinner. For dinner, she had a slice of cheese pizza and some bottled water. Afterward, she joined a group of campers at the campfire for a round of ghost stories.

July 1:

Rosie got up and went to breakfast where she had eggs, oatmeal, and some orange juice. After breakfast, she went to the lake for a swim lesson. Around noon, she went to lunch and had some BBQ chips, a half of an egg salad sandwich, and brownies/ice cream with a Dr. Pepper. After lunch, she headed to an archery lesson, which she left early to take a nap. After her nap, she headed to dinner and had a several pieces of garlic bread and two slices of yellow cake with a Mountain Dew. After dinner, Rosie wrote in her diary before working on a jigsaw puzzle and heading to bed.

Subject 13:-----

Marina is a 24-year-old camp counselor at Camp Crystal Lake. She began to feel ill a few hours after dinner around 9 pm on July 2. She reported having a high fever, stomach cramps, and diarrhea, which persisted for 2 days.

June 30:

Marina got up early and went to breakfast in the morning along with the campers. She had bacon and eggs along with a banana and some apple juice. She left breakfast early to get ready for the canoe trip she was leading for the campers. After putting away all the equipment after the trip, she headed back to the cafeteria for lunch. There she had a veggie burger, celery, and diet coke. She also had a few BBQ chips that she took from a friend. She left lunch early to get ready to for the three hour hike that afternoon. After the hike, she and two other counselors went out for dinner. It is unclear what she ate for this meal.

July 1:

Marina woke early and headed to the cafeteria for eggs and sausage. She also had orange juice. She led a hike after breakfast and returned around noon to the cafeteria for lunch. At lunch, she had half a turkey & cheese as well as the egg salad sandwich. She also had an apple and some carrots. Lastly, she treated herself to a small portion of brownie and vanilla ice cream. She then went out to teach the archery class. After class, she had dinner, which consisted of chicken noodle soup and half a slice of yellow cake with a Diet Coke.

Subject 14:-----

Sarah is a 13-year-old female. She did not report feeling ill.

June 30:

After waking up, Sarah walked directly to the cafeteria for the 8:30 am breakfast. She had eggs over easy, a banana, and a glass of apple juice. She then walked over to the lake for a morning swim lesson. At 11:45 am, she went back to her room to shower for the 12:15pm lunch. For lunch, Sarah ate a hamburger and a side of french fries with ketchup. After lunch, Sarah joined her fellow campers for a three-hour hike. After the hike, she went back to her room for a short rest before dinner. For dinner, Angela took a slice of pepperoni pizza and drank a sprite. After dinner, Angela went to the campfire with the other campers.

July 1:

Sarah had eggs and sausage for breakfast along with a glass of orange juice. After breakfast, she went hiking and enjoyed some bird watching during the hike. At 11:45 am, she went back to her room to shower and get ready for lunch. At lunch, Sarah ate a turkey and cheese sandwich along with some carrots and a brownie with vanilla ice cream. After lunch, she went to the craft cabin to paint pottery. After finishing up in the craft cabin, Sarah returned to her room and read. For dinner, Sarah had a large bowl of spaghetti with meatballs and a slice of garlic bread along with bottled water. She then went down to the campfire with all the other campers.

Subject 15:-----

Curtis is a 13-year-old male. He began to feel sick around 8:30 am on July 2. He complained about nausea, a high fever, and severe diarrhea. His symptoms continued for 3 days.

June 30:

Curtis got up earlier than usual, so early that the cafeteria wasn't open, so he went for a walk around the lake. At 8:15 am, he was the first in the cafeteria. He had a few pieces of bacon as well as some orange juice. After breakfast, he went on the canoe trip with some of the other campers. Sometime during the trip, Curtis fell into the water and had to be rescued since he could not swim. After his rescue, he was very thankful to be alive, but was shaken up, and he began to vomit. He went to lie down and skipped lunch and tried to get some rest. He woke up just in time for dinner and said he was feeling better. At dinner, Curtis had one slice each of cheese, sausage, and pepperoni pizza. He washed it down with 2 cans of coke and a bottle of water. Later that night, his camper roommate, Carter, shared 2 homemade peanut butter cookies with him.

July 1:

Curtis woke up feeling refreshed and heading to the cafeteria after his morning jog around the lake. For breakfast, he had some oatmeal and a banana. After breakfast, Curtis spent some time playing checkers with another camper, Suzy. At noon, Curtis headed to the cafeteria. He sat down and had BBQ chips, carrots, and an egg salad sandwich for lunch. Afterward, he opted to work on pottery rather than to take a dip in the lake since he was still feeling a little nervous about being in the water. Once Curtis finished his craft, he headed to the cafeteria where he had spaghetti, marinara sauce, and meatballs for dinner. He followed that with a bowl of tomato soup

and a slice of yellow cake. He then went to bed to try and read. He woke up the next morning feeling very sick to his stomach.

Subject 16:-----

Vanessa is a 12-year-old female. She did not report feeling ill.

June 30:

Vanessa woke up early for a jog and then headed to the cafeteria for the 8:30 am breakfast. She had bacon, a banana, and some orange juice. She then walked over to the lake for her morning swim lesson. For lunch, Vanessa ate a veggie burger and some french fries with mustard. After lunch, Vanessa joined her fellow campers for a three-hour hike. After the hike, she went back to her room to shower and wrote a poem about her time at camp. For dinner, Vanessa ate two slices of pizza: 1 cheese slice and 1 pepperoni slice. She also drank a sprite. After dinner, Vanessa went to the campfire with the other campers.

July 1:

Vanessa had eggs and sausage for breakfast along with a glass of orange juice. After breakfast, Vanessa went down to the lake for her second swim lesson. At 11:45 am she went back to her room to shower and get ready for lunch. At lunch, Vanessa ate a turkey sandwich and an apple. After lunch, Vanessa went to her archery lesson, which she really enjoyed since she hit all but one of her targets. Afterward, she rested in her room. For dinner, Vanessa had tomato soup and a slice of garlic bread. In the evening, she opted to write in her diary rather than go to the campfire.

Subject 17:-----

Larry is a 35 yr old male and is the Camp Crystal River cook. He did not report feeling ill.

June 30:

Larry woke up early to prepare for the 8:30am breakfast, which he himself did not eat. After preparing lunch, he ate a meal, which consisted of a hamburger, french fries, celery sticks, and a bottle of water. After lunch, he ordered more food supplies to last him through the week. Afterward, Larry prepared that evening's dinner. He had dinner at the camp, which consisted of two slices of sausage pizza. He then went home to relax and play with his dog.

July 1:

Larry came into work around 7:00am. He prepared a full breakfast for the campers. Later, he enjoyed some of the oatmeal he had prepared. After breakfast, Larry went for a stroll around the lake. After getting some fresh air, he returned to the cafeteria to prepare lunch. At lunch, he had 3 grilled cheese sandwiches since the walk around the lake made him very hungry. He washed it down with a coke. After preparing the dinner for the campers, he had dinner at the camp and enjoyed a bowl of spaghetti and meatballs with a cup of tomato soup and a sprite before going home for the day.

Subject 18:-----

Michael is a 14-year male. He began feeling sick at 3:00 am July 3rd. His symptoms included minor nausea, a high fever, and persistent diarrhea. The symptoms lasted for about 24 hours.

June 30:

Michael woke early and went for a jog before breakfast. At the cafeteria, he ate eggs and had a glass of orange juice. After breakfast, Michael decided to go on the canoe trip. The canoe trip ended earlier than anticipated because one camper fell into the river. So Michael grabbed a book and read by the lake until lunch. At lunch, he enjoyed a hamburger, fries and diet coke. After lunch, he took a hike with a couple of his friends. They got lost in the woods, but after an hour of searching finally found the camp at 6:30pm. Dinner had already started and they were all famished. Michael ate three pieces of pepperoni pizza and another diet coke. After dinner, he was exhausted and went to his room to rest. He stayed in for the rest of the night, snacking on a granola bar he had brought from home.

July 1:

Michael again woke early and went for a jog. At the cafeteria, he ate a large plate of eggs, sausage, and a glass of orange juice. He then went down to the lake with some friends to swim. After spending a couple of hours down by the lake, he returned to his cabin for a shower and then headed to the cafeteria for lunch. Michael ordered a grilled cheese sandwich and a bag of plain chips. His friend Samantha didn't like her egg salad sandwich, so Michael decided to try it. He took a couple of bites and decided that he too did not like egg salad. After lunch, he headed to the craft cabin to paint. His dream was to become an artist and he has happy to have some time to paint here at the camp. By the time he was finished it was time for dinner. He had a plate of

spaghetti and two pieces of cake. After dinner, he went down the campfire with some friends and relaxed there until he went to bed.

Subject 19:-----

Ellen is an 11 yr old female. She did not report feeling ill.

June 30:

Ellen skipped breakfast, but woke in time for the morning canoe trip. Ten campers, including Ellen canoed down the Crystal River from 9:00 am-12:00 pm, returning in time for the 12:15pm lunch. Ellen ate a veggie burger with a side of mustard and a can of Dr. Pepper. After lunch, Ellen went for a hike. For dinner, Ellen went back to the cafeteria and had a slice of pepperoni pizza and a can of sprite with a chocolate ice cream sandwich. After dinner, Ellen and the rest of the campers sat by the campfire and told ghost stories.

July 1:

Ellen had eggs and apple juice for breakfast. She then headed on the intense hike around the campgrounds. She was starving after her long trip and ate two turkey and cheese sandwiches, with carrot sticks, and a bottle of water. After lunch, Ellen read in her room and spoke to her mother on the phone before heading off to the craft cabin for pottery painting. At 4:00pm, Ellen rushed to her swim lesson. After the lesson, she showered and headed to dinner. For dinner, Ellen ate a small bowl of chicken noodle soup and two slices of garlic bread and big piece of yellow cake. Ellen then headed down to the nightly campfire.

Subject 20:-----

Sofia is a 29-year-old female counselor. She first reported feeling sick at 12:00 pm, July 2. She had symptoms of vomiting and diarrhea.

July 30:

Sofia woke early and headed to breakfast. She had an apple and a glass of orange juice. After breakfast, she went down to the lake to teach swimming lessons. She had been a competitive swimmer when she was younger and loved teaching the kids. After her lessons, she went back to her room to shower. At lunch, she ate a veggie burger and a diet coke. After lunch, she went back to the lake to teach the afternoon swim lessons. By 5pm, she was exhausted and headed back to her cabin to relax before dinner. Around 5:30pm, some of the other counselors invited her to dinner at a nearby restaurant. It is unclear what she ate.

July 1:

After her morning job, Sofia headed to the cafeteria. She ate a small bowl of oatmeal and a banana. After breakfast, she went down to the lake to teach more swimming lessons. After the lessons, she went back to her room to shower, read, and call her family. At lunch, Sofia ate with some of the campers and had half a grilled cheese sandwich and half an egg salad sandwich and some celery. After lunch, Sofia led a beginner's canoe trip down the river. She returned a few hours later and went back to her room to change. At dinner, Sofia took a bowl of tomato soup and a piece of garlic bread. She was too full to eat dessert. After dinner, she supervised the nightly campfire.

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