

Lesson Title	Quinceañera Celebration
Lesson Designer	Chandra Kelsey, MPH, CHES
Standards	<input type="checkbox"/> CCSS <input type="checkbox"/> NGSS <input type="checkbox"/> ASCA <input checked="" type="checkbox"/> Other Public Health learning competencies covered: [1.1, 1.2, 1.4, 1.6, 1.7, 4.3]
Learning Objectives	Students will be able to: <ul style="list-style-type: none"> • Describe the role of an epidemiologist and how they promote, prevent disease, and protect health. • Understand prevalence of foodborne illnesses, their signs and symptoms and human impact. • Be able to use an odds ratio (OR) to determine likely source of outbreak.

Timeline	Duration
Who/what/where/why of health depts <ul style="list-style-type: none"> • 15-minute Lesson: What does a health department do (federal, local, state) (slides 1-12). Complete worksheet side 1 during lesson, discuss answers. Getting involved with the health department (careers, volunteering, user of services) <ul style="list-style-type: none"> • 10-minute lesson: Ten Essential Services, slide deck (slides 13-15) & worksheet side 2 • 15-20 minutes: Students can work in groups to complete the Worksheet using web resources listed on slides 15-16. • 5 minutes: Group Share 	1 class period (30-45 minutes)

Teaching Strategies/Student Actions	Monitoring
Introduction <ol style="list-style-type: none"> 1. Brief description of Epidemiology and it's relation/function in Public Health. Focus on health department epi roles. 2. Safe food handling practices-handwashing, holding temperatures, time, proliferation. Discuss top 3 food born illnesses related to the foods served. Symptoms, onset, foods usually found in. Activity – Quinceañera Celebration <ol style="list-style-type: none"> 3. What is a quinceañera? [<i>cultural humility competency</i>] 4. On the board, have written prior to the game, four columns with the food type and list of ingredients/preparation information 5. Hand out index cards (1 per person) and tell the students that they went to a quinceañera in which several people got sick; four foods were narrowed down to be the culprits 6. Discuss the ingredients and preparation of each food. Ask which food they think it is BRIEFLY. Have them write down the 4 foods and mark with a 1 & 2 for the top 2 suspected foods. 7. Continue filling in chart for each food with the number of people who ate it and got sick; ask if their opinion has changed about the culprit. Have them revisit their card with the #1 & #2 suspected foods. Cross out original marking and indicate the updated top 2 suspected foods (if they changed). RECOMMENDED INSTRUCTIONS: For a large group (30+): provide the numbers of people who ate each and fill in as you go.	<ul style="list-style-type: none"> • Teacher will explain expectations and tasks. • Teacher will move around the room to observe student progress and ensure students are on correct web page • Teacher will provide a time reminder of 5 minutes and one minute to wrap up research before discussing findings as a group.

<p>Small group (less than 30): For each food, ask the number of people who ate each and record it on the board; ask which food they now think it might be. (If you choose this method, allow time, and ensure students have a calculator to do simple multiplication and division, you will need to calculate the odds ratios and identify the dish of the highest likelihood to have caused the illness).</p> <p>Odds Ratios</p> <ol style="list-style-type: none"> 8. Explain that the way to figure out which food is to look at Odds Ratios (explain BRIEFLY an odds ratio). When do we use Odds Ratio and Relative Risk? 9. Do each 4-square/OR to figure out the culprit for each food 10. Ask which they think NOW was the culprit and discuss how their opinions may have changed throughout <p>Discussion OPTIONAL:</p> <ol style="list-style-type: none"> 11. Ask if any questions about the activity completed. Conduct an informal poll of raising of hands (or e-poll if doing online) to see how many people washed their hands before the last time they ate? Share and reinforce the group proper handwashing techniques. 12. Importance to monitor your symptoms, self-treatment, when to seek medical attention and role of testing and reporting (re-enforce role of epidemiologists and reportable illnesses). 	
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Resources and Materials	Additional Notes
	Detailed Lesson Plan/Facilitators Guide included

References and Additional Supporting Websites for Instructors
<p>¹ Association of Schools & Programs for Public Health. Epidemiology. https://thisispublichealth.org/epidemiology/.</p> <p>² Association of Schools & Programs for Public Health. All Areas of Study. https://thisispublichealth.org/all-areas-of-study/.</p> <p>³ Centers for Disease Control and Prevention. Food Safety Home Page, Foodborne Germs and Illnesses. https://www.cdc.gov/foodsafety/foodborne-germs.html</p> <p>⁴ Connecticut Department of Public Health. Foodborne Pathogens Active Surveillance Network (FoodNet). https://portal.ct.gov/DPH/Epidemiology-and-Emerging-Infections/Foodborne-Pathogens-Active-Surveillance-Network-FoodNet</p> <p>⁵ United States Department of Agriculture. Food Safety and Inspection Service, Keep Food Safe! Food Safety Basics. https://www.fsis.usda.gov/food-safety/safe-food-handling-and-preparation/food-safety-basics/steps-keep-food-safe</p> <p>⁶ Minnesota Department of Health. Shigella Fact Sheet. https://www.health.state.mn.us/diseases/shigellosis/shigella.html#:~:text=Shigella%20is%20found%20in%20the%20are%20not%20fully%20toilet%2Dtrained.</p> <p>⁷ González, R. (2019). Introduction. Coming Out Latinx. In <i>Quinceañera Style: Social Belonging and Latinx Consumer Identities</i> (pp. 1-28). New York, USA: University of Texas Press. https://doi.org/10.7560/319680-003</p> <p>⁸ Szumilas M. Explaining odds ratios. <i>J Can Acad Child Adolesc Psychiatry</i>. 2010 Aug;19(3):227-9. Erratum in: <i>J Can Acad Child Adolesc Psychiatry</i>. 2015 Winter;24(1):58. PMID: 20842279; PMCID: PMC2938757</p> <p>⁹ Mayo Clinic. First Aid, Foodborne illness. https://www.mayoclinic.org/first-aid/first-aid-food-borne-illness/basics/art-20056689#:~:text=Foodborne%20illness%20often%20improves%20on,for%20more%20than%20several%20days</p>

Recap of the main pillars of public health in this learning task:

Prevent Disease	Promote health	Protect health
<ul style="list-style-type: none"> ● Washing hands is the most effective way to prevent the transmission of germs/microbes that can make us sick ● Storing and reheating food to the recommended temperatures will reduce the risk of foodborne illness ● Holding foods at the recommended temperatures for the recommended time will reduce the risk of foodborne illness ● Proper training in cross-contamination in food preparation will reduce the risk of foodborne illness 	<ul style="list-style-type: none"> ● Enforce rules that all food preparers and handlers to stay home if they are sick ● Educate all food handlers on safe food storage and reheating practices ● Provide equipment for proper handwashing 	<ul style="list-style-type: none"> ● Inspections of food service providers to assure training and compliance are being followed ● Investigate outbreaks of reported foodborne illness ● Track data on outbreaks and inform the public of the emerging threat and proper steps to follow

Detailed Lesson Plan/Facilitator Guide

I.

- a) An epidemiologist is a public health professional that studies of trends, patterns, and causes related to disease in populations. They are interested in how diseases spread among given populations. Epidemiologists create complex analytical models to help us understand the causes of and solutions to these diseases more clearly¹. They can work for local or state health departments. Another job at a health department is a sanitarian, they work closely with epidemiologists. One of the roles of a sanitarian is to focus on “identifying and decreasing the risk to the public from foodborne illness by surveillance, monitoring occurrences of bacterial pathogens, and responding to public health complaints”². They do inspections at places that serve people like hair and nail salons as well as restaurants and facilities that make and serve food. They can close a facility if serious health and safety violations are discovered.
- b) Following safety precautions in handling cooking and storing food are essential to prevent getting sick. You can't see, smell, or taste harmful bacteria that can led to illness³. [Safe food handling practices include Cleaning (wash hands and surfaces often); Separate (don't cross-contaminate-raw ingredients needing to be cooked coming into contact with those that will be eaten uncooked. i.e., cutting raw meat with a knife then using the same knife to cut up a fruit salad); Cook (cook foods to recommended temperatures-check with a food thermometer); Chill (refrigerate promptly; if hot foods sit out ensure they are kept at a holding temperature either under 40 degrees for cold items or over 140 degrees for hot foods; limit the time food sets out). When safe food handling practices are not followed bacteria grows rapidly, we call this proliferation. With a higher the dose of ingested bacteria, there are increased odds of developing an illness from it. In CT approximately 20,000 people report contracting a foodborne illness each year. The top 3 food born illnesses are: Salmonella, Campylobacter, and Shigella⁴. Symptoms for Salmonella include diarrhea, fever, chills, and stomach pain starting anywhere from 6 hours to 6 days after exposure and lasting for several weeks. It can be found in many foods including: chicken, turkey, beef, pork, eggs, fruit, sprouts or other vegetables, and processed foods (i.e., chicken nuggets)⁵. Campylobacter symptoms include diarrhea (sometimes bloody), fever, and stomach cramps, nausea, and vomiting. It can start between 2-5 days after ingestion and last for about a week. This is commonly found in raw or undercooked poultry or cross contamination with it. Also, it is found in seafood, meat, and produce. Shigellosis (people with a Shigella infection) starts showing signs 1-2 days after consuming infected food, people will experience diarrhea (it can be bloody), fever, severe stomach cramping, and dehydration. It is found in foods such as: salads (potato, shrimp, tuna, chicken, macaroni, fruit, and lettuce), lunch meat, oysters, milk, beans, etc. This bacterium is found in the stool of infected people and can spread this through coming into contact with water, food, or on surfaces that are shared with others⁶. These top 3 illnesses share many of the same symptoms.

II.

- a) A Quinceañera is a cultural rite of passage when a girl turns 15. This tradition started with the Aztecs in pre-Columbian Mexico and is celebrated throughout the Latinx community⁷. It is like the American sweet 16 celebration.
- b) Write on the board or display prepared slide with the chart of food at the party.
- c) Hand out the cards, writing instruments, and calculators if using/needed.
- d) Discuss foods and preparation techniques. Have them identify the top 2 suspected foods.
- e) Provide the numbers of infected/not, exposed/not OR collect the numbers from the group.
- f) Ask the students to revisit their chosen top 2 suspected foods. Have them cross out and re-number if there are changes.

III.

a) Explain what an odds ratio is: “An odds ratio (OR) is a measure of association between an exposure and an outcome. The OR represents the odds that an outcome will occur given a particular exposure, compared to the odds of the outcome occurring in the absence of that exposure”⁸. In our exercise we will look at relationship of the exposure to a food eaten and the outcome of getting a foodborne illness. It is a ratio or probability of an event to non-event (in this case, the event is getting sick). If the calculation of the OR is =1 the exposure does not affect the odds of the outcome, if it is greater than 1, there is a higher chance of a relationship of getting sick from that food/exposure, and if the OR is less than 1 there is a lower chance the illness is associated with that food.

Another way to quantify risk of disease is called Relative Risk (also known as risk ratio, RR). This is a method used to calculate the risk of disease from an event versus the risk in another group. This compares an exposed group to a control or non-exposed group. An example of this could be those who attended a study session for an exam and passed with A's compared to those who did not attend the study session. This calculation helps determine the association between the intervention of the study session and getting A's to those who did not go to the study session.

b) Using completed the 4 square charts, have the students perform the calculations for determining the OR for each dish.

In order to find the OR multiply the exposed with disease # with the not exposed no disease #. In the example below for beef tamales this will be $6 \times 5 = 30$. Next, you will multiply the no disease and exposed with the # of not exposed with disease, $8 \times 6 = 48$. Divide 30 by 48 to get: 0.625. Because this association is less than 1 it is not strongly correlated to the outbreak of foodborne illness at this event.

Beef Tamales

	Disease	No Disease	Totals
Exposed	6	6	12
Not Exposed	8	5	13
Totals	14	11	25

OR= 0.625 (0.63)

IV. Optional Discussion

- a) Handwashing poll and explain proper handwashing technique (demonstrate or show a visual guide).
- b) Reinforce self-care by emphasizing the importance to monitor your symptoms (log of foods eaten recently, monitor temperature, note frequency and type of symptoms, stay home); how to self-treat (hydrate, use of over-the-counter medication such as pain relievers & antidiarrheals), when to seek medical attention (high fever, bloody stool, severe cramping, vomiting lasting more than 2 days, diarrhea lasting more than several days⁹) and role of testing and reporting to your doctor and local health department (re-enforce role of epidemiologists and reportable illnesses).

Odds Ratio Tables for Each Food

** In order to keep the food source outcome, please use these numbers. The example below has a total of 14 sick people for all boxes. If you choose to use different numbers, you will need to re-calculate the odds ratio for each and identify the food associated with the outbreak.**

$$OR = \frac{\text{odds of event in exposed group}}{\text{odds of event in non-exposed group}} = \frac{a/b}{c/d} = \mathbf{ad/bc}$$

Beef Tamales

	Disease	No Disease	Totals
Exposed	6	6	12
Not Exposed	8	5	13
Totals	14	11	25

OR= 0.625 (0.63)

Green salad

	Disease	No Disease	Totals
Exposed	12	6	18
Not Exposed	2	5	7
Totals	14	11	25

OR= 5.00

Ceviche

	Disease	No Disease	Totals
Exposed	4	6	10
Not Exposed	10	5	15
Totals	14	11	25

OR= 0.33

Cake

	Disease	No Disease	Totals
Exposed	9	10	19
Not Exposed	5	1	6
Totals	14	11	25

OR= 0.18

Food Served at the Party

Food Item	Contents	Preparation
Beef tamales	ground beef, ground pork, sour cream, ground corn (masa)	Premade at a local restaurant, and reheated on day of party
Green salad	Hand torn lettuce, chopped onion, chopped carrots, chopped tomatoes	On-site, on day of the party
Ceviche	Package of pre-cooked shrimp, squeeze of lime, orange juice avocado, fresh salsa (tomato, onion, cilantro, jalapeno)	On-site, on day of the party
Cake	Flour, eggs, milk, vanilla, whipped cream	Baked and brought by a guest to the party