School of Public Health
Syllabus and Course Information

UNIVERSITY OF MINNESOTA
Driven to Discover℠

PubH 6183
Theory and Practice in Foodborne Disease Outbreak Detection, Investigation and Control
Spring/2019 7 week

Credits:	**1**
Meeting Days:	**Wednesday**
Meeting Time:	**4:00-6:00pm**
Meeting Place:	**1155 Conference Room, Mayo Building**
Instructor:	**Craig Hedberg and Kirk Smith (MN)**
	Hillary Booth, Paul Cieslak, and Jeffrey Bethel (Integrated Food Safety Centers of Excellence, OR) Elaine Scallan (Integrated Food Safety Centers of Excellence, CO)
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Office Hours:	**by appointment**

I. Course Description

This course is intended for Public Health students interested in food safety and food safety professionals seeking a deeper understanding of the rapidly changing methods used to detect and investigate outbreaks of foodborne diseases. The course focuses on the practical basis for developing and implementing methods for foodborne disease outbreak detection, investigation and control; using recent outbreaks to highlight underlying principles. The course will review biological characteristics of major foodborne disease pathogens, clinical features of the illnesses they cause and epidemiologic presentations of foodborne outbreaks. The implications of these characteristics will be discussed in a problem solving, seminar format that examines theory and practice in the context of recent outbreaks. Strategies to promote timely decision-making will be emphasized.

II. Course Prerequisites

Introductory course in Epidemiology, instructor permission. Students should have a working knowledge of epidemiologic concepts and methods, such as making comparisons by person, place, and time, and calculating measures of association. This course builds on individual introductory lectures on outbreak investigations (PubH 6341) and foodborne diseases (PubH 6385) and provides the theoretical and practical

basis for developing new and emerging outbreak investigation methods (PubH 6181). While this course builds on content in these other courses, the focus of this course is distinct and complementary to them.

III. Course Goals and Objectives

Upon completion of this course, students should be able to:

1. Describe how the clinical and epidemiologic features of outbreak-associated illnesses can be used to identify the likely causative agent of a foodborne outbreak.
2. Describe how food commodity and exposure setting affects the epidemiologic presentation of an outbreak.
3. Evaluate practical options for conducting outbreak investigations based on available resources.
4. Explain the theoretical basis for the chosen options.

IV. Methods of Instruction and Work Expectations

This course is comprised of independent reading, lectures, and group discussions including faculty and staff from the Integrated Food Safety Centers of Excellence in Minnesota, Oregon and Colorado. The course will feature brief lectures from one of the instructors, followed by extended discussion of outbreaks to highlight the key points being discussed. Current outbreaks and notable outbreaks published in the literature will be discussed. Students will be provided with a weekly reading list and will be expected to have read the material before class, and to come to class prepared to discuss the outbreaks. Student participation is mandatory and will be graded. Each class period will include approximately 100 minutes of shared class time with the other Centers. Each class period will include 2-3 periods of site-specific discussions lasting 5-10 minutes each to address specific questions raised during class. Each site will briefly report on their discussions.

A series of individual and group exercises will be assigned to highlight the topics discussed in class. Individual assignments will be due at the end of the week they are assigned, and can be turned in through the course website, or e-mailed to instructors. For group exercises, groups will be formed to include students from each of the three Centers. Groups will be expected to work together outside of class, and present their work during class. The topic of each assignment is listed in the Course Outline. Each assignment will be worth 5 points.

Discussion Board Participation:

Students will be expected to participate in on-line discussions held on the Discussion Board during weeks 1, 3 and 5.

Instructions:

• Answer the questions below and post to this discussion board. You must write in complete sentences, and your post must contain a minimum of 100 words.

• You also need to reply to at least two of your classmates' responses. Your replies should be substantive and contain a minimum of 50 words each.

o Do you agree or disagree? Why?

o Do you have questions based on the postings?

Week 1: Some investigators argue that social media should be used more frequently to detect outbreaks. Others are not convinced about the power of social media.
• What impact do you think social media could have on outbreak detection? Explain.
• What types of outbreaks will social media detect?

Week 3: Investigators frequently have to balance how much detail they can get about specific exposures versus how many exposures they can try to get information about.
• For a given outbreak, what factors would influence your choice of approach (more specificity versus more exposures)?
• What exposures always warrant collecting extra detail?

Week 5: Determining what led to the occurrence of an outbreak frequently depends on evaluating the source of contamination.
• What makes an environmental assessment different from a risk-based inspection?
• What is the difference between a contributing factor and a root cause? Describe some examples that highlight these differences.

V. Course Text and Readings

The texts for this course are both available on-line:

GUIDELINES FOR FOODBORNE DISEASE OUTBREAK RESPONSE

Available at: http://www.cifor.us/documents/CIFOR%20Industry%20Guidelines/CIFOR-Industry-Guideline.pdf.

FDA's "Bad Bug Book"

Available at:
http://www.fda.gov/downloads/Food/FoodSafety/FoodborneIllness/FoodborneIllnessFoodbornePathogensNaturalToxins/BadBugBook/UCM297627.pdf

In addition to the readings identified in the Course Outline, readings related to recent and current outbreaks will be provided as warranted to highlight new and emerging outbreak investigation methods. Links to readings that are in the public domain will be provided on the course web-site. Reprints will be made available to download for articles that are not otherwise accessible.

VI. Course Outline/Weekly Schedule

Week	Dates	Topic/ Readings	Assignments	Due dates
1	1/23/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: Craig Hedberg** Overview of class. Introduction of key concepts Foodborne diseases: Agents, foods, and food-agent interactions CIFOR *Guidelines* Chapter 2 Outbreak identification: 1.Outbreaks associated with events and establishments • Predicting the agent based on clinical/incubation period profiles in outbreak settings 2. Outbreaks detected by pathogen-specific surveillance CIFOR *Guidelines* Chapter 4 • Impact of changing laboratory practices on surveillance o CIDT o WGS	**Review** on-line assignments, **complete** "bad bug and bad food" worksheets. **Participate in Discussion Board:** Some investigators argue that social media should be used more frequently to detect outbreaks. Others are not convinced about the power of social media. • What impact do you think social media could have on outbreak detection? Explain. • What types of outbreaks will social media detect? Each class should **determine** the reporting timelines for *Salmonella* in their state, from CIDT positive to WGS. What % of CIDT get WGS?	1/27
2	1/30/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: Kirk Smith** Tools for Solving Foodborne Outbreaks: Hypothesis generation: 1. Descriptive information: Case demographics, epidemic curves. 2. History of serotype, PFGE subtype: Past outbreaks, non-human isolates.	**Complete** worksheet regarding hypotheses for the source of an outbreak based on descriptive epidemiology of possible outbreak provided in class.	2/3

3	2/6/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: Jeffry Bethel** Exposure assessment for hypothesis generation and testing: How questionnaire design determines what you can figure out about the outbreak.	**Develop** a questionnaire to identify the source of the outbreak for which you have generated preliminary hypotheses. **Participate in Discussion Board:** Investigators frequently have to balance how much detail they can get about specific exposures versus how many exposures they can try to get information about. • For a given outbreak, what factors would influence your choice of approach (more specificity versus more exposures)? • What exposures always warrant collecting extra detail?	2/10
4	2/13/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: Elaine Scallan** Analytic studies: How and when to use cohort, sub-cluster, or case-control studies, case-case comparisons, binomial comparisons with traceback, or none of the above.	**Complete** worksheet regarding analytic approaches to investigating a series of outbreaks, based on the outbreak setting and the number and distribution of cases detected.	2/17
5	2/20/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: TBD** Environmental assessments and root cause analyses. Integrating information from across the investigation (EPI, EH, Lab, tracebacks, food and environmental micro) to tell a compelling story that explains the outbreak.	**Participate in Discussion Board:** Determining what led to the occurrence of an outbreak frequently depends on evaluating the source of contamination. • What makes an environmental assessment different from a risk-based inspection? • What is the difference between a contributing factor and a root cause? Describe some examples that highlight these differences.	2/24

6	2/27/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: TBD** Public health interventions (exclusions, restrictions, closures, recalls, regulations, litigation, and lessons learned).	**Complete** worksheet regarding justification for potential public health interventions and risk communication messages for various outbreak scenarios.	3/3
7	3/6/2019	**4:00-4:15 Individual site time.** **4:15-6:00 Joint session.** **Class Lead: TBD** Building the evidence base to prevent future outbreaks. **Class group presentations.**	**Complete** worksheet regarding potential impact of CIDT and WGS on Salmonella surveillance.	3/12

VII. Evaluation and Grading

This course will be offered on an S-N basis. There will be a total of 35 points awarded for class assignments (5 points each for seven assignments) and 15 points will be awarded for class participation (5 points for each discussion board participation). Students must earn at least 35 points to earn an S for the course.

Course Evaluation
Beginning in fall 2008, the SPH will collect student course evaluations electronically using a software system called CoursEval: www.sph.umn.edu/courseval. The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: www.sph.umn.edu/grades. All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

Incomplete Contracts
A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: www.sph.umn.edu/grades.

University of Minnesota Uniform Grading and Transcript Policy - A link to the policy can be found at onestop.umn.edu.

VIII. Other Course Information and Policies

Grade Option Change (if applicable)
For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at onestop.umn.edu.

Course Withdrawal

Students should refer to the Refund and Drop/Add Deadlines for the particular term at onestop.umn.edu for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at sph-ssc@umn.edu for further information.

Student Conduct Code
The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf.

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

Use of Personal Electronic Devices in the Classroom
Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Scholastic Dishonesty
You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code: http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: http://www1.umn.edu/oscai/integrity/student/index.html. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

Makeup Work for Legitimate Absences
Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html.

Appropriate Student Use of Class Notes and Course Materials

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html.

Sexual Harassment
"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf

Equity, Diversity, Equal Opportunity, and Affirmative Action
The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf.

Disability Accommodations
The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, https://diversity.umn.edu/disability/.

Mental Health and Stress Management
As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: http://www.mentalhealth.umn.edu.

Academic Freedom and Responsibility: *for courses that do not involve students in research*
Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost. *[Customize with names and contact information as appropriate for the course/college/campus.]*

** Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".*

Bad Bug Work Sheet

Agent: Salmonella

1. Symptoms of disease:

2. Incubation period:

3. Duration of illness:

4. Diagnostic methods:

5. Host species/reservoir:

6. Food sources associated with outbreaks:

7. Ability to grow on food:

8. Food analytic methods:

Bad Food Work Sheet

Food item: Tomato

1. Type of food: Categorize based on Painter JA, Hoekstra RM, Ayers T, Tauxe RV, Braden CR, Angulo FJ, et al. Attribution of foodborne illnesses, hospitalizations, and deaths to food commodities by using outbreak data, United States, 1998–2008. Emerg Infect Dis [Internet]. 2013 Mar [date cited]. http://dx.doi.org/10.3201/eid1903.111866)

2. Prevalence of consumption: Based on FoodNET Atlas of Exposures FoodNet Population Survey Atlas of Exposures, 2006-2007 (http://www.cdc.gov/foodnet/surveys/FoodNetExposureAtlas0607_508.pdf)

3. Demographic characteristics of consumption:

4. How is food item produced, distributed, and consumed?

5. Agents causing outbreaks linked to food item:

6. What are outbreak settings linked to food item?

7. How is food item contaminated in outbreak settings?