

One Health: Animal, Human, and Environmental Connections
Fall 2020 Course Syllabus

Meeting Time and Location:

Location TBA, Medford, MA
Mondays, 1:30 PM – 4:00 PM

Course Instructor:

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Course Objectives

- Describe the role and benefits of a One Health approach in addressing high priority health issues.
- Develop the habit of evidence-based discourse whether an issue/idea is being supported or refuted.
- Identify 3-5 evidence-based responses to questions posed. Reference class discussion and readings in responses.
- Understand the context/background information presented for each question/issue.

Course Schedule

Date	Topic	Lead/Speaker(s)
1: 9/14/20	Introduction to One Health, Course, Assignments	Linder
2: 9/21/20	ZOO: Zoonotic Disease Introduction	Castellot/Linder
3: 9/28/20	ZOO: Zoonotic Disease and Global Health	Castellot
4: 10/05/20	ENV: Environment and Antimicrobial Resistance	Nadimpalli
5: 10/12/20	ENV: Environment and Nutrition	Bezares
6: 10/19/20	HAI: Human-Animal Interaction Introduction	Linder/Mueller
7: 10/26/20	HAI: Human-Animal Interaction Applied	Linder/Gibbs/Boo
8: 11/02/20	SD: Shared Diseases and Obesity & Cancer	Linder/Gardner
9: 11/09/20	SD: Shared Diseases and Dental	Dhadwal/Rosenblad/Dragan
10: 11/16/20	AOH: One Health in Pet Food	Linder/Cash
11: 11/23/20	AOH: One Health Communications	Linder/Rutberg/Gualtieri
12: 11/30/20	Celebrating One Health: Presentation of Class Projects	Linder/Students
13: 12/07/20	Celebrating One Health: Presentation of Class Projects	Linder/Students

Presentation Details*

***Readings and activities are subject to change and a final syllabus will be available August**

Week 1	Introduction to One Health, Course, Assignments	Linder
Topic:	Introduction to One Health	
Activities:	Professional applications of One Health, group discussion, brainstorming for capstone presentation	
Suggested Reading:	1. USAID One Health Workforce Overview (PDF will be provided to students)	
Assignments:	Group discussion, interactive brainstorming session with peer review	
Week 2	ZOO: Zoonotic Disease Introduction	Castellot/ Linder
Topic:	Introduction to Zoonotic Diseases, with case examples for discussion (e.g. SARS, Ebola, Zika)	
Activities:	Group Discussion	
Required Reading:	2. Rabinowitz et al. "One Health and emerging infectious diseases: clinical perspectives." https://www.ncbi.nlm.nih.gov/pubmed/22976348 3. Fisman et al. "The 'One Health' paradigm: Time for infectious diseases clinicians to take note?" https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2951799/	
Assignments:	Group discussion write up	
Week 3	ZOO: Zoonotic Disease and Global Health	Castellot
Topic:	One Health and the Global Health Security Agenda: Antimicrobial resistance, Zoonotic disease, Workforce development	
Activities:	Introduction and discussion on the Global Health Security Agenda (GHSA)	
Required Reading:	Global Health Security Agenda: 4. Explore the GHSA website to develop an overview of the GHSA. https://www.ghsagenda.org/ GHSA Action Packages: 5. Antimicrobial Resistance (https://ghsagenda.org/home/action-packages/antimicrobial-resistance/) 6. Zoonotic Disease (https://ghsagenda.org/home/action-packages/zoonotic-disease/) 7. Workforce Development (https://ghsagenda.org/home/action-packages/workforce-development/)	
Assignments:	<ul style="list-style-type: none"> Take a position: The GHSA strives to decrease the impact of zoonotic disease on global health. Is 	

	<p>organization of this effort across multiple countries and partners a strength or a weakness? Or both?</p> <ul style="list-style-type: none"> • Prepare a one-page set of recommendations for enhancing the structure of the GHSA. Reference specific GHSA packages in your responses. 	
Week 4	ENV: Environment and Antimicrobial Resistance	Nadimpalli
Topic:	One Health and the Environment: Antimicrobial Resistance	
Activities:	Discussion to include: introduction to antibiotic resistance and connections between humans, animals, and the environment; overview of antibiotic use in livestock production; drivers of changing food production systems; environmental impacts of large-scale animal farming; concepts of environmental justice	
Required Reading:	<p>8. Review: US nonprescription antibiotic use may be widespread. Center for Infectious Disease and Policy Research. http://www.cidrap.umn.edu/news-perspective/2019/07/review-us-nonprescription-antibiotic-use-may-be-widespread</p> <p>9. In a Poor Kenyan Community, Cheap Antibiotics Fuel Deadly Drug-Resistant Infections. https://www.nytimes.com/2019/04/07/health/antibiotic-resistance-kenya-drugs.html</p>	
Assignments:	<ul style="list-style-type: none"> • Prior to class, find any online news article or opinion piece that discusses animal production (chicken, pigs, cattle) in one of the following developing countries where antibiotic use in food animals is expected to be highest in the next 30 years: China, Brazil, Mexico, India. Answer the following: <ul style="list-style-type: none"> ○ What is the main message? ○ What category of individuals (e.g. government ministers, economists, farmers, activists), reports (e.g. National Economic Forecast), or organizations (e.g. FAO, Ministry of Health) are quoted in the article? ○ Were any concerns raised about the human, animal, or environmental impacts of increased animal production? • Persuasive commentary from a stakeholder position in each category: farmer, medical doctor, veterinarian (to do during class). 	
Week 5	ENV: Environment and Nutrition	Bezares
Topic:	World food supply and livestock production. Discussion to include: introduction to the global food system; general production trends and associated trade patterns; the role of livestock in the world; livestock's contribution to climate change; climate impacts on crop quality.	

Activities:	Group Discussion	
Required Reading:	<p>10. Clark, et al. "Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice." (2017). http://iopscience.iop.org/article/10.1088/1748-9326/aa6cd5/meta</p> <p>11. Evich, Helena B. "The great nutrient collapse" Politico (2017). https://www.politico.com/agenda/story/2017/09/13/food-nutrients-carbon-dioxide-000511</p> <p>Suggested Reading:</p> <p>12. Rebecca Boehm, Parke E. Wilde, Michele Ver Ploeg, Christine Costello, Sean B. Cash. "A Comprehensive Life Cycle Assessment of Greenhouse Gas Emissions from U.S. Household Food Choices." Food Policy, 2018; DOI: 10.1016/j.foodpol.2018.05.004</p> <p>13. McMichael, et al. "Food, livestock production, energy, climate change, and health." The lancet 370, no. 9594 (2007): 1253-1263. http://www.thelancet.com/journals/lancet/article/PIIS0140-6736(2007)2961256-2/abstract</p>	
Assignments:	1-2-page reflection to be completed prior to class, responding to: should you change your diet based on the concerns introduced by the readings?	
Week 6	HAI: Human-Animal Interaction Introduction	Linder/Mueller
Topic:	Introduction to HAI, definitions of assistance animals, discussion of how the media portrays HAI.	
Activities:	Group discussion and debate	
Required Reading:	<p>14. Harold Herzog, "The Impact of Pets on Human Health and Psychological Well-Being: Fact, Fiction, or Hypothesis?": http://journals.sagepub.com/doi/full/10.1177/0963721411415220</p> <p>15. Sandra McCune, Katherine A. Kruger, James A. Griffin, Layla Esposito, Lisa S. Freund, Karyl J. Hurley, Regina Bures, Evolution of research into the mutual benefits of human–animal interaction, <i>Animal Frontiers</i>, Volume 4, Issue 3, July 2014, Pages 49–58, https://doi.org/10.2527/af.2014-0022</p>	
Assignments:	Group write up and debate during class regarding pros and cons of emotional support animals.	
Week 7	HAI: Human-Animal Interaction Applied	Linder/Gibbs/Boo
Topic:	Animal-assisted interventions	

Activities:	Demonstration of therapy animal visitation, group discussion on therapy animals and the various interventions that exist.	
Required Reading:	16. Linder et al, Amer J. Infect: http://www.ajicjournal.org/article/S0196-6553(17)30633-8/abstract 17. TIHAI Manual for Facilities: http://hai.tufts.edu/paws/download-the-manual/	
Assignments:	Persuasive commentary from a stakeholder position in each category: animal, handler, participant, facility	
Week 8	SD: Shared Diseases and Obesity & Cancer	Linder/ Gardner
Topic:	Introduction to naturally occurring animal diseases that also occur in people	
Activities:	Introduction and interactive discussion	
Required Reading:	18. Genetics of Obesity in Dogs: https://www.nytimes.com/2017/05/16/magazine/the-genetics-of-pooched-out-pooches.html 19. Can Clinical Trials on Dogs and Cats Help People? https://www.sciencemag.org/news/2016/08/can-clinical-trials-dogs-and-cats-help-people 20. Of Mice, Dogs and Men: Dr. Cheryl London - TEDxOhioStateUniversity 2015. https://www.youtube.com/watch?v=xaX9P2AxAHI	
Assignments:	<ul style="list-style-type: none"> • In class debate on pros and cons of clinical trials in companion animals vs. traditional laboratory animal research. • Outline for capstone presentation (due before class that day, Dr. Linder to provide info) 	
Week 9	SD: Shared Diseases and Periodontitis	Dhadwal/ Rosenblad/ Dragan
Topic:	Periodontal disease and shared health	
Activities:	Dr. Rosenblad will speak on veterinary dentistry and Dr. Dragan will speak on dentistry in humans. Discussion will be focused on: Periodontal disease in humans and canines. Topics discussed will be: clinical signs, pathogenesis, link between periodontitis and different systemic diseases especially cardiovascular diseases and various prevention and treatment options. Various animal models for periodontal disease progression and their contribution in understanding the progression of the periodontal disease in humans.	
Required Reading:	21. Batchelor, P. "Is periodontal disease a public health problem?" https://www.nature.com/articles/sj.bdj.2014.912	

	22. Williams, L. "One Health and Dentistry." https://www.researchgate.net/publication/281483340_One_Health_and_dentistry	
Assignments:	Group discussion write up	
Week 10	AOH: One Health in Pet Food	Linder/Cash
Topic:	This week will serve as an interactive session to explore how many aspects of One Health are needed to address pet food.	
Activities:	Class discussion	
Required Reading:	23. Heinze article: https://theconversation.com/a-big-pawprint-the-environmental-impact-of-pet-food-74004 24. Cash, et al. article (on Canvas in "Readings" folder)	
Assignments:	Active participation in discussion will be only graded assignment.	
Week 11	AOH: One Health Communication	Linder/Rutberg/Gualtieri
Topic:	Communication and Public Policy of One Health concepts	
Activities:	Guest Speakers (Lisa Gualtieri; Public Health and Community Medicine), Allen Rutberg (Center for Animals and Public Policy), time set aside for students to meet and discuss final preparations for presentations	
Required Reading:	25. Cippola et al. "From "One Health" to "One Communication": The Contribution of Communication in Veterinary Medicine to Public Health." Vet Sci. 2015; 2(3): 135–149. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5644635/ 26. CDC What is Health Communication?; Available online: http://www.cdc.gov/healthcommunication/healthbasics/whatishc.html 27. McShea, William J. "Ecology and management of white-tailed deer in a changing world." Annals of The New York Academy of Sciences. 2012; 45-56. (on Canvas in "Readings" folder). 28. Wood et al. Biodiversity and disease: a synthesis of ecological perspectives on Lyme disease transmission. Trends in Ecology and Evolution 28(4):239-247. https://www.ncbi.nlm.nih.gov/pubmed/23182683	
Assignments:	Group discussion write up during class	
Week 12	Celebrating One Health: Presentation of Class Projects	Linder/Students
Activities:	No reading assignments, students will peer review one another's presentations.	

Week 13	Celebrating One Health: Presentation of Class Projects	Linder/ Students
Activities:	No reading assignments, students will peer review one another's presentations.	

Grading Criteria

The course format is designed to promote student preparation, interactive discussion and intellectual accountability for issues considered. Attendance is required. Students are expected to arrive to class on time and behave as if they were the speaker. Participation is required of all students in group assignments and class discussion. All viewpoints are welcomed and will be respected. Students should strive to develop communication habits that promote collegial discussion with their peers and others, independent of the content of the discussion.

Component	Percentage of Final Grade
Weekly in-class, group discussion write-ups	25%
Class attendance and individual preparation for and participation in class discussion	25%
Preliminary outline of presentation	15%
Capstone presentation	35%

Bibliography of Sources that Relate to the Course (Required Readings)

The amount of preparatory material for each class period is variable. Required readings for each class are intended to provide a context for the lecture or to supplement lecture content. Some material may be included in the readings that will not be specifically addressed in the lecture, although it may all be included in discussion. Students will get the most out of this course if readings are completed prior to the class for which they are assigned.

1. USAID One Health Workforce Overview (PDF will be provided to students)
2. Rabinowitz et al. "One Health and emerging infectious diseases: clinical perspectives." <https://www.ncbi.nlm.nih.gov/pubmed/22976348>
3. Fisman et al. "The 'One Health' paradigm: Time for infectious diseases clinicians to take note?" <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC2951799/>
4. Explore the GHSA website to develop an overview of the GHSA. <https://www.ghsagenda.org/>
5. Antimicrobial Resistance (<https://ghsagenda.org/home/action-packages/antimicrobial-resistance/>)
6. Zoonotic Disease (<https://ghsagenda.org/home/action-packages/zoonotic-disease/>)
7. Workforce Development (<https://ghsagenda.org/home/action-packages/workforce-development/>)
8. Review: US nonprescription antibiotic use may be widespread. Center for Infectious Disease and Policy Research. <http://www.cidrap.umn.edu/news-perspective/2019/07/review-us-nonprescription-antibiotic-use-may-be-widespread>
9. In a Poor Kenyan Community, Cheap Antibiotics Fuel Deadly Drug-Resistant Infections. <https://www.nytimes.com/2019/04/07/health/antibiotic-resistance-kenya-drugs.html>

10. Clark, et al. "Comparative analysis of environmental impacts of agricultural production systems, agricultural input efficiency, and food choice." (2017).
<http://iopscience.iop.org/article/10.1088/1748-9326/aa6cd5/meta>
11. Evich, Helena B. "The great nutrient collapse" Politico (2017).
<https://www.politico.com/agenda/story/2017/09/13/food-nutrients-carbon-dioxide-000511>
12. Rebecca Boehm, Parke E. Wilde, Michele Ver Ploeg, Christine Costello, Sean B. Cash. "A Comprehensive Life Cycle Assessment of Greenhouse Gas Emissions from U.S. Household Food Choices." Food Policy, 2018; DOI: [10.1016/j.foodpol.2018.05.004](https://doi.org/10.1016/j.foodpol.2018.05.004)
13. McMichael, et al. "Food, livestock production, energy, climate change, and health." The lancet 370, no. 9594 (2007): 1253-1263.
<http://www.thelancet.com/journals/lancet/article/PIIS0140-6736%2807%2961256-2/abstract>
14. Harold Herzog, "The Impact of Pets on Human Health and Psychological Well-Being: Fact, Fiction, or Hypothesis?":
<http://journals.sagepub.com/doi/full/10.1177/0963721411415220>
15. Sandra McCune, Katherine A. Kruger, James A. Griffin, Layla Esposito, Lisa S. Freund, Karyl J. Hurley, Regina Bures, Evolution of research into the mutual benefits of human-animal interaction, *Animal Frontiers*, Volume 4, Issue 3, July 2014, Pages 49–58,
<https://doi.org/10.2527/af.2014-0022>
16. Linder et al, Amer J. Infect: [http://www.ajicjournal.org/article/S0196-6553\(17\)30633-8/abstract](http://www.ajicjournal.org/article/S0196-6553(17)30633-8/abstract)
17. TIHAI Manual for Facilities: <http://hai.tufts.edu/paws/download-the-manual/>
18. Genetics of Obesity in Dogs: <https://www.nytimes.com/2017/05/16/magazine/the-genetics-of-pooched-out-pooches.html>
19. Can Clinical Trials on Dogs and Cats Help People?
<https://www.sciencemag.org/news/2016/08/can-clinical-trials-dogs-and-cats-help-people>
20. Of Mice, Dogs and Men: Dr. Cheryl London - TEDxOhioStateUniversity 2015.
<https://www.youtube.com/watch?v=xaX9P2AxAHI>
21. Batchelor, P. "Is periodontal disease a public health problem?"
<https://www.nature.com/articles/sj.bdj.2014.912>
22. Williams, L. "One Health and Dentistry."
https://www.researchgate.net/publication/281483340_One_Health_and_dentistry
23. Heinze article: <https://theconversation.com/a-big-pawprint-the-environmental-impact-of-pet-food-74004>
24. Cash, et al. article (on Canvas in "Readings" folder)
25. Cippola et al. "From "One Health" to "One Communication": The Contribution of Communication in Veterinary Medicine to Public Health." Vet Sci. 2015; 2(3): 135–149.
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5644635/>
26. CDC What is Health Communication?; Available online:
<http://www.cdc.gov/healthcommunication/healthbasics/whatishc.html>
27. McShea, William J. "Ecology and management of white-tailed deer in a changing world." Annals of The New York Academy of Sciences. 2012; 45-56. (on Canvas in "Readings" folder).

28. Wood et al. Biodiversity and disease: a synthesis of ecological perspectives on Lyme disease transmission. *Trends in Ecology and Evolution* 28(4):239-247.
<https://www.ncbi.nlm.nih.gov/pubmed/23182683>

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