

Title: Epidemiology Bootcamp – Study design & diagnostic testing

Course Description & Objectives: This workshop is designed to be a collaborative learning environment for the epidemiology student at any education level as well as more seasoned epidemiologists. It is designed around active learning pedagogy which facilitates a higher level of learning and longer-term recall of concepts. With this in mind, this course is intended to lay a strong foundation in epidemiological study design and diagnostic testing. We will start with a review of the basics and then move into intermediate level concepts. Expect this to be a very interactive experience with your peers!

1. By the end of this course, students will be able to critically evaluate epidemiological studies reported in the scientific literature

Component skills

- Compare and contrast design characteristics of epidemiological studies
- Evaluate epidemiological studies for bias, confounding, and validity
- Compare and contrast sampling strategies used in epidemiological studies
- Interpret measures of association reported in epidemiological studies
- Develop a study to address case-specific scientific questions (study design activity)

2. By the end of this course, students will be able to develop diagnostic testing strategies for disease in an individual and population.

Component skills

- Calculate and interpret measures of disease occurrence in populations
- Calculate and interpret measures of association for disease risk factors
- Compare the impact of diagnostic testing characteristics on test utility
- Construct diagnostic testing strategies for disease detection in populations
- Assess impact of disease prevalence on predictive values
- Perform an outbreak investigation in a population (outbreak activity)

3. By the end of this course, students will be able to apply active learning pedagogy in epidemiology education. (Note: Example materials will be provided that attendees can use in their own teaching)

Component skills

- Explain the science behind active learning pedagogy
- Perform active learning in a classroom environment

Workshop Specification: This is a 2-day, in-person, pre-conference workshop for up to 24 participants. It will be offered in English and priority registration will be given to ISVEE delegates. It is recommended that participants have had at least an introductory epidemiology course and should bring a basic calculator. This workshop will be conducted by a team of educators:

- **Brandy A. Burgess, DVM, MSc, PhD, DACVIM (LA), DACVPM** – Dr. Burgess is an associate professor of epidemiology and infection control, Department of Population Health, College of Veterinary Medicine; the Director of Infection Control, Veterinary Teaching Hospital; and Assistant Dean for Clinical Services, Veterinary Medical Center, University of Georgia. Her areas of research focus on infectious disease epidemiology and prevention, diagnostic test assessment, epidemiology education and communications. Dr. Burgess uses many approaches in her teaching including active learning and service learning pedagogies, as well as archives-based instructional design (i.e. using primary documents) and reacting to the past role-playing games (a type of active learning) to learn key concepts using historical examples.

- **Helen Aceto, PhD, VMD** – Dr. Aceto is Associate Professor of Veterinary Epidemiology at the University of Pennsylvania School of Veterinary Medicine and Director of Biosecurity at the New Bolton Center Hospital for Large Animals. The hospital receives over 6,000 patient visits annually, as a critical care referral center with a 24/7 Emergency Service this includes a large proportion of animals with infections zoonotic in nature and/or nosocomial threats. Dr. Aceto’s areas of clinical expertise are zoonotic diseases in large animals, biosecurity, infection control, and outbreak management. Her primary research interests are *Salmonella* epidemiology in cattle and horses, and development and implementation of biosecurity, disease control and diagnostic testing strategies for animal healthcare and community settings.
- **Annette O’Connor, BVSC, MVSC, DVSC, FANZCVSC** – Dr. O’Connor is a veterinarian and quantitative epidemiologist who is particularly interested in the application of epidemiology to better inform policy related to food safety, one health, animal welfare, animal health, and veterinary clinical practice. Dr. O’Connor has been a leader in efforts to translate research into practice by reducing research wastage and maximizing the value of research. She has led initiatives that seek to improve the reporting of all research involving animals; these initiatives have required international collaborations and have had international impact on reporting in veterinary science.
- **Rebecca Smith, DVM, MS, PhD** – Dr. Smith is a veterinarian and a One Health epidemiologist. Her research focuses on the use of complicated and heterogeneous data sets to guide operational decision-making for disease control and mitigation. Dr. Smith led efforts to validate and deploy the CovidShield saliva-based PCR test, which is now in use at dozens of colleges and universities, thousands of K-12 schools, and companies across the world.

Schedule for workshop

Day	Time	Activity/Contents	Details
1	8:30-10:00	Epidemiological approach	-Use historical examples to frame the importance of study design and diagnostic testing in disease management and prevention
	10:00-10:30	bio break	
	10:30-12:00	Epidemiological study designs I	-Basic observational studies, measures of association, study bias and validity
	12:00-13:00	lunch break	
	13:00-14:30	Epidemiological study design II	-Higher-order studies (e.g., nested case-control), study bias and validity
	14:30-15:00	bio break	
	15:00-16:30	Study design activity	-Scenario-based activity to determine which study design would be ‘best’ to answer a particular question considering biases – 2 scenarios (1 large animal, 1 small animal) – Groups will present their ideas
2	8:30-10:00	Diagnostic testing	-Diagnostic testing characteristics applied to case-based examples
	10:00-10:30	bio break	
	10:30-12:00	Diagnostic test selection & interpretation	-Diagnostic test selection & interpretation applied to case-based examples
	12:00-13:00	lunch break	
	13:00-14:30	Outbreak activity	-Outbreak scenario – Groups will work through an outbreak – 2 scenarios (1 large animal, 1 small animal)
	14:30-15:00	bio break	
	15:00-16:00	Outbreak activity & Wrap-up	-Groups present a summary of findings and short course wrap up