



" ECO-EPIDEMIOLOGY OF INFECTIOUS DISEASES "
Elective Inter-institutional Postgraduate Course
Semester 2 (August 6 - November 30, 2024)

Introduction:

The human population depends on ecosystem services to satisfy its social needs because ecosystems are essential as regulators of atmospheric temperature, to guarantee the availability of water and food, for the purification of air, water and soil, as well as to regulate populations of parasites and organisms that transmit infectious agents to humans and other animals. Consequently, alterations of our ecosystems can affect both human and animal health.

The transformation of ecosystems and effects of climate change, as well as the mobility of human and animal populations, and the transport of organic products around the world, are factors that are promoting the introduction or reintroduction of invasive exotic species (insects and pathogens). Such "spillover" effects occur both in endemic and non-endemic areas causing epidemic outbreaks and in some cases pandemics, increasing the number of cases, as well as their persistence over time.

This course uses an ecological perspective to elucidate the factors that influence the emergence, maintenance, and increased transmission of human pathogens. The program of the course focuses on pathogens transmitted to humans by arthropod vectors or animals (Zoonosis), such as malaria, dengue and other arbovirus, leishmaniasis, Chagas, rickettsiosis, among others.

The course will emphasize the design and appropriate methodologies for eco-epidemiological studies of tropical diseases, considering the importance of the different scenarios of human interaction, reservoirs and vectors with the different determinants (biological, climatological, social, economic and cultural), that promote the transmission of the disease in particular endemic territories. At the same time, prevention and control strategies will be reviewed with particular consideration of community-based strategies. The course utilizes a combination of lectures, literature analysis, practical exercises and discussions as analysis and learning strategies.

Participants:

Postgraduate students in Biomedical, Biological, or related Sciences (master's and doctoral degrees). Young investigators with knowledge in biology, microbiology, ecology, entomology, population genetics, and/or basic epidemiology and university faculty, public health personnel and researchers.

Objectives:

- Introduce the concepts of eco-epidemiology to understand the relationship between ecosystems and the risk of transmission of infectious diseases.
- Exemplify and explain how these interactions can be analyzed, modeled, and mapped to identify prevention and/or mitigation strategies.
- Understand how ecosystem alterations such as biodiversity loss, ground cover transformation and climate change influence the cycles of pathogenic agents.
- Strengthen capacities to design, plan and execute field eco-epidemiologic studies in rural and urban communities.
- Promote critical thinking and the integration of information to identify the risk factors that favor the transmission of these diseases.

Chronogram: Tuesdays 10:00 AM – 12:00 M (Colombian time)

No.	Date	Subject	Speaker
Introduction to eco-epidemiology			
1	August 6	Eco-epidemiology models for investigation, prevention and control of infectious diseases.	Lyda Osorio, MD, PhD Professor Universidad del Valle (Colombia)
2	August 13	Ecosystem health, Human-animal interaction.	Carlos Valderrama, PhD Professor Universidad del Rosario (Colombia) Carlos Saavedra, MSc, PhD Wildlife Conservation Society
3	August 20	Climate change and vector-borne diseases.	Oscar Daniel Salomón, PhD Director INMeT – Instituto Nacional de Medicina Tropical (Argentina)
4	August 27	National Epidemiological and Genomic Surveillance System.	Instituto Nacional de Salud (Colombia)
Fundamentals of tropical disease vector ecology			
5	September 3	Communicable diseases in urban areas (e.g. dengue, leptospirosis).	Clara Ocampo, PhD Research Associate CIDEIM (Colombia) Albert Ko, MD Yale University
6	September 10	Rickettsiosis. Example of vector-reservoir-environment-environment interaction: Following the experience of Brazil from Colombia.	Juan David Rodas, PhD Professor, Universidad de Antioquia Co-PI Fogarty GID program UTMB/UdeA
7	September 17	Chagas disease transmission scenarios. Approach from eco-epidemiology.	Gabriel Parra, MSc, PhD Head of the Health Research Center for the Tropics Universidad Cooperativa de Colombia
8	September 24	Malaria: Elimination and Climate Change.	Neila Julieth Mina Possu, DSc Senior Regional Malaria Manager, Central America and Hispaniola Clinton Health Access Initiative
Study models			
9	October 1	Epidemiological analysis - case study, the Colombia model.	Isabel Rodríguez-Barraquer, MD, PhD Associate Professor University of California San Francisco



			Lyda Osorio, MD, PhD Professor Universidad del Valle (Colombia)
10	October 8	Mathematical modeling of infectious diseases.	Isabel Rodríguez-Barraquer, MD, PhD Associate Professor University of California San Francisco
11	October 15	Niche study in arthropods and its use in the evaluation of transmission risk – Leishmaniasis model.	Neal Alexander, PhD Investigator, Leader of Epidemiology and Biostatistics Unit, CIDEIM Carlos Valderrama, PhD Professor Universidad del Rosario (Colombia)
12	October 22	Round table (discussion groups based on a case).	
Prevention and control strategies			
13	October 29	Experience and lessons learned from covid-19.	Zulma Cucunuba, MD, MSc, PhD Professor Pontificia Universidad Javeriana (Colombia)
14	November 5	Climate change and environmental justice.	Fabian Mendez, PhD Professor Universidad del Valle (Colombia)
15	November 12	Community participation and the coordination of social and institutional stakeholders.	Carlos Rojas, MD, PhD Professor Universidad de Antioquia Diana Castro, PhD Researcher Universidad de Antioquia
16	November 19	Round table (Discussion groups based on a case).	
	November 20-30	Closing of the course and final activities in participating universities.	

Modality

The course includes weekly videoconferences through the Zoom platform given by national and international experts. All participants must review the recommended readings for each session. Graduate students who register the course as an elective must complete the reading report activity before the class, which consists of answering 2 or 3 questions as confirmation of reading. The professors who coordinate the courses within the participating universities will define the evaluation strategies according to the course credits in their program and will establish the grade by activity and final grade of their students.

It is suggested as evaluation activities during the course, 2 exams (quizzes) gradable through the Moodle platform. Grades will be given to each student by the course coordinators at each university. Participating universities may include additional criteria in defining the course grade for their programs.

Articles and recommended readings for each conference will be published on the Moodle platform: www.cideim.org.co/moodle.

Credits: 3

2 hours per week for 16 weeks and 4 hours per week of independent student work.

Course/Grade Evaluation

- **For students who register the course as an elective in their Postgraduate programs:**
 - Attendance at synchronous meetings: 25%
 - Literature reviews 30%: by the day before attending the synchronous meeting, students must send answers to the reading tests based on the conference topics through CIDEIM's Moodle platform.
 - Quiz 1 and 2: 45% (the distribution of percentages allocated for the quizzes will be defined by each professor in the universities that register the course as an elective)
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- **Attendees (participants who do not register the course as an elective in a graduate program) who seek certification**
 - Attendance of at least 80% of the synchronous meetings scheduled in the course

Contacts:

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