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# Global Health and Epidemiology

## Course Coordinator:

STEFANIA BOCCIA

## Faculty:

Stefania Boccia, Claire Edwards, Stefano Vella, Mario Carere, Angelo M. Pezzullo, Leonardo Villani, Drieda Zace

## Overview

**Area:** Health Sciences

**Dates:** June 10 - 21 (2 weeks)

**Campus:** Rome

**Course Number:** HL/PP300

**Term:** Summer 2024

**Credits:** 6 ECTS

## Course description

One of the overall goals of the course is introducing the students to the concepts and definitions of epidemiology and global health, as well as global health challenges governance. The course will enable students to calculate and interpret the measures of the global health burden of diseases, health indicators and major determinants of disease. Moreover, an overview on ethical issues raised in the field of global health will be provided, covering a wide range of global bioethics topics and human rights issues. One part of the lessons will be focused on infectious diseases and outbreaks but will also cover the topics of vaccination policies around the world. Non-communicable diseases (NCDs) will be explored, placing particular focus on the global epidemic rise of these conditions and preventive measures. The increase in population movement has substantial public health implications, thus, the course will provide an overview of global migration and international experiences when addressing the health needs of migrants and refugees. Moreover, the course will cover one of the major global emergencies related to environmental exposures and their impact on the population health. In particular, one part of the lessons will be focused on Planetary Health and climate crisis, which poses a threat to health with both a direct effect on health (cardiovascular disease, respiratory disease, mental disorders) and an indirect effect (migration, alteration of work activities).

The course will use an interactive teaching approach, covering lectures, practical exercises, open discussions, and group analyses. At the end of the course students will take a mandatory final exam covering contents of the whole program.

## Prerequisites

- Principles of global health or health sciences
- Basic principles of epidemiology
- Basic principles of statistics
- Highly motivated and interested in the global health thematic
- Ability to work in a team



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## Course Requirements

- Students are expected to regularly attend class sessions and to actively take part in class debate and case discussions
- Students are expected to be prepared on the assigned readings
- Students are expected to deliver one group assignments and present it to the class

## Topics

- The global burden of disease and the use of epidemiological indicators
- Globalization and global health
- Ethical challenges in the context of global health
- Genomics and public health
- Vaccination policies
- Migration and health
- Environmental health, Planetary Health and major global emergencies

## Learning Outcomes

- Understanding the principles of global health, major challenges and global health governance
- Ability to understand and apply epidemiological indicators
- Understanding global bioethics topics and human rights issues
- Acquisition of an international perspective of vaccination policies worldwide
- Understanding global environmental exposures and the impact on population health

## Teaching Methods

- Lectures, team working and in class discussion, site visits, role playing and case studies.

## Faculty

Stefania Boccia  
Claire Edwards  
Stefano Vella  
Mario Carere  
Angelo M. Pezzullo  
Leonardo Villani  
Drieda Zace

## Evaluation

- Assessment of in class participation (30%)
- Mid-term practical session - Group assignments (case studies presentation) (30%)
- Final exam (multiple choice test) (40%)



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## Detailed Description of The Assignments

- For the mid-term assessment, students will be divided into groups, according to their background, in order to have an equal distribution of different backgrounds in each group. A topic will be assigned to each group and students will be asked to give a presentation of the work.
- The final exam will be a written exam composed of 30 multiple choice questions. The weights of lectures in the questions of the final exam will be:
  - Lecture 1: Public health and Epidemiology: 4 questions
  - Lecture 2: Major global emergency: Global warming and environmental exposures impacting population health: 2 questions
  - Lecture 3: Microbiome Epidemiology: 3 questions
  - Lecture 4: Food security as a human right and global health challenge: 3 questions
  - Lecture 5: Vaccines and vaccination policies: a global picture: 3 questions
  - Lecture 6: Healthcare emergencies management: 3 questions
  - Lecture 7 Antimicrobial Resistance: 2 questions
  - Lecture 8: The global burden of disease and the use of epidemiological indicators: 2 questions
  - Lecture 9: Genomics and public health: 3 questions
  - Lecture 10: Global health - from current challenges to governance: 3 questions
  - Lecture 11: Interactive session/working groups: 2 questions

## Readings

- Selection from: Charles Guest, Walter Ricciardi, Ichiro Kawachi, and Iain Lang (2013) Oxford Handbook of Public Health (5 ed.), OXFORD UNIVERSITY PRESS
- WHO: World health statistics 2018: monitoring health for the SDGs, sustainable development goals (2018)
- WHO: guidelines on ethical issues in public health surveillance (2017) WHO: Global Vaccine Action Plan Report (2017)
- Selection of reading from individual faculty members

## Schedule

- Lecture 1: Public health epidemiology
- Lecture 2: Major global emergency: Global warming and environmental exposures impacting population health
- Lecture 3: Microbiome and Epidemiology
- Lecture 4: Food security as a human right and global health challenge
- Lecture 5: Vaccine and vaccination policies: a global picture
- Lecture 6: Healthcare emergencies management
- Lecture 7: Antimicrobial Resistance: a global challenges
- Lecture 8: The global burden of disease and the use of epidemiological indicators
- Lecture 9: Genomics and public health
- Lecture 10: Global health - from current challenges to governance
- Lecture 11: Interactive session/working groups
- Discussion & Q&A for the exam. Final exam, final remarks and conclusion.



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## Rules of conduct

**Attendance:** Attendance is mandatory, and no absence/s will be excused. Please consider that Field Trips are considered equal to regular classes and indeed you are expected to attend the visits. Unexcused absences will not be accepted. An excused absence will only be granted if you are seriously ill and can support your claim with a local doctor's certificate dated the day you missed class (therefore you must go to the doctor that same day) that has to be delivered to the Professor or to UCSC International Office. Any other absence will not be excused and will result in not being admitted to the final exam, which corresponds to a 0 (zero) in the final exam.

**Exam Date:** The exam date cannot be re-scheduled. Should the dates of the final exams be moved for force major reasons, UCSC International Office and the Professor will promptly inform you in class and/or via e-mail on the new date agreed. Unexcused absences to the exams will result in a failing grade in the course.

In cases of unforeseeable circumstances such as illness or injury on the day of the exams, you must submit a medical certificate and communicate your absence to the Professor and UCSC International Office via email prior to the exam. If the student does not justify his/her absence through sufficient documentation and with adequate notice before the final test, you will receive an automatic Failed. Absences for other unforeseeable circumstances will not be accepted and will result in a failing grade.

## Biographies

### STEFANIA BOCCIA

Stefania Boccia is Full professor of Hygiene, Preventive Medicine and Public Health at Università Cattolica del Sacro Cuore in Rome, and Research Director for Policlinico Universitario A. Gemelli – IRCCS. She is Deputy Research Director of the Policlinico Universitario A. Gemelli IRCCS and Affiliate of the Meta-Research Innovation Center at Stanford, Stanford, UK. She is the President of the European Public Health Epidemiology Section of the European Public Health Association (EUPHA), Associate Editor of European Journal of Epidemiology and European Journal of Public Health, Member of the Advisory Board of the Lancet Regional Health - Europe. She currently coordinates the EU funded projects “European network staff eXchange for integrATing precision health in the health Care sysTEms” (ExACT) and “A PeRsonalized Prevention roadmap for the future HEalThcare” (PROPHET). She coordinates the “Interaction of genomic and dietary aspects in gastric cancer risk: the global StoP project” project, funded by the Italian Ministry of Health, Bando 2022 Ricerca Finalizzata, the “Innovative approaches for personalised cardiovascular prevention: multicentre randomised controlled study and multidisciplinary evaluation for a National Health Service implementation” project, funded by the Italian Ministry of Health, PNRR: M6/C2\_CALL 2022, and the “Generation Gemelli: longitudinal study for the evaluation of maternal exposome on the newborn and child health” project, funded by UCSC (linea D3, University research projects of interest). She has an H index of 52 and 9312 citations at december 2022.

### CLAIRE EDWARDS

Claire Edwards is an Assistant Professor of Biological Sciences at St. Edward's University in Austin, TX. She obtained her Ph.D. in Microbiology from the University of Georgia, Athens, GA. She is on the leadership team for the NSF funded Institute for Interdisciplinary Sciences (i4) and the USDA funded NextGen E3 Program: From Education and Experiential Learning to Employment. Her teaching experience includes courses in Microbiology, Human Microbiome, Virology and Parasitology. Her research interests include fermentation of plant biomass for bioethanol production and the study of antibiotic resistant microbes in soil.



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### **STEFANO VELLA**

Stefano Vella, MD achieved specialty degrees in both Infectious Diseases and Internal Medicine. He is currently adjunct Professor of Global Health at Università Cattolica del Sacro Cuore in Rome, Italy, and member of the Program Committee of Horizon Europe (Health Cluster 2021-2027). He was the Director of the Global Health Center of the National Institute of Health and, until 2016, he was the Director of the Drug Department of the National Institute of Health. Dr. Vella is the former President of the Italian Drug Agency. His research group works and publishes extensively on various aspects of HIV pathogenesis, treatment and prevention. Dr Vella, has been invited as speaker in over 100 International Conferences, is an article reviewer for numerous journals, including Science, Lancet, Journal of Infectious Diseases, AIDS, Journal of AIDS, and he has published more than 200 articles in international journals. Since 1996, as Member of the Governing Council of the International AIDS Society [IAS] and subsequently as IA President (2000-2002), he actively worked towards promoting access to treatment and care in the South of the World and moving the international AIDS conferences in the South of the World. Indeed, he was chair of numerous WHO therapeutic guidelines for the prevention and treatment of HIV/AIDS. Finally, he was scientific advisor of the Italian Ministry of Foreign Affairs, of the Ministry of Finances and of the Ministry of Health.

### **MARIO CARERE**

Dr. Mario Carere is a PhD Biologist, Senior Researcher at the Department Environment and Health of the Italian Institute of Health. He has a long experience in the field of exposure and risk evaluation linked to the contamination of aquatic environments. He is currently co-chairing the “WG Chemicals” in the context of the Common Implementation Strategy of the Water Framework Directive. He has contributed to the elaboration of European guidelines about water chemical monitoring, effect-based methods, environmental quality standards. At national level his research work is related to the use of effect-based methods for surface water monitoring and to the evaluation of the risks for human health and the environment in polluted sites. He is author of several national and international publications.

### **ANGELO MARIA PEZZULLO**

Researcher with specific experience, education, and interests in the methods of research and evidence synthesis for public health. Vice President since 2022 of the Public Health Epidemiology section of the European Public Health Association (EUPHA). Has visited and conducted research at various Italian and foreign institutions: Istituto Superiore di Sanità (Rome, 2018), EUPHA (Utrecht, Netherlands, 2019-20), Department of Epidemiology at Erasmus MC (Rotterdam, Netherlands, 2020-22), Meta-Research Innovation Center at Stanford (Stanford, USA, 2022, 2024), Jefferson College of Population Health (Philadelphia, USA, 2022). Contributed to the foundation and served as scientific director of the Italian Institute for Planetary Health from 2019 to 2022. Earned an MD in 2016 from the University of Campania, a MSc in Epidemiology at the Erasmus University Rotterdam in 2020, and board certification in Public Health and Preventive Medicine (2021) and a PhD in Public Health (2024) at UCSC.

### **LEONARDO VILLANI**

Leonardo Villani is a MD, specialist in Hygiene and Preventive Medicine and assistant professor at Università Cattolica del Sacro Cuore in Rome. He is mainly involved in national and international research projects related to the epidemiology of infectious diseases, AMR, leadership in healthcare systems, vaccination, environmental health, health determinants and health policies at national and international level.

### **DRIEDA ZACE**

Currently enrolled as an Infectious Diseases Resident, has a medical degree, followed by a Master in Epidemiology and Biostatistics and PhD in Biomedical Sciences and Public Health from the Catholic University of Sacred Heart, Rome. Has been working as a research collaborator for Center for Global Health Research and Studies focusing mainly on social inequalities like food insecurity among children and women, migrants' and unaccompanied minor refugees' health. Various experiences in teaching statistics and research



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methodology at university. Scientific experience consolidated through the participation in different conferences, seminars and trainings as well as the publication of several papers in international journals in the role of author or co-author. Fellow of the “European network staff eXchange for integrating precision health in the health Care Systems” (ExACT) project, funded by European Union’s Horizon 2020 Marie Słodowska-Curie - Research and Innovation Programme.