4TH EURESTOP TRAINING SCHOOL – PULA, CROATIA

23 – 25 JUNE 2026

"*FROM DATA TO ACTION: ESTIMATION METHODS AND DATA VISUALIZATION FOR ANTIMICROBIAL RESISTANCE BURDEN*"

TRAINING SCHOOL OVERVIEW

Goal statement:	The aim of this 3-day training school is to strengthen participants' understanding of the methodologies used to estimate the burden of antimicrobial resistance (AMR) and to develop their capacity to translate these findings into evidence-informed policies and interventions, as well as to build competencies in data visualization, effective communication of scientific evidence, and the transformation of complex epidemiological data into actionable insights. The training will offer an in-depth overview of the data sources, analytical approaches and modelling frameworks underpinning AMR burden assessments at both global and national levels. Through a combination of expert-led lectures and interactive practical sessions, participants will learn how to interpret, access, and apply estimates generated by the Global Research on Antimicrobial Resistance (GRAM) project and its associated online platforms. By the conclusion of the training school, participants will be equipped to use these methods and resources to support AMR surveillance and policy development, with particular relevance to European settings as well as low- and middle-income countries (LMICs) – thereby strengthening their ability to contribute to national and global efforts to address AMR.
Outcomes:	• Describe the analytical methods used in estimating the burden of sepsis, syndromes, and pathogens in the context of AMR, including the calculation of associated vs. attributable burden, relative risks and the application of multiplication methods. • Identify the data sources required for estimation of AMR at global and local levels. • Perform analyses on data to understand GRAM methods, download results and analyze and interpret results. • Use MICROBE and other tools for downloading and interpreting AMR metrics and usage within local and international contexts. • Utilize the GRAM estimates to inform clinical decisions and enhance local data collection approaches aimed at reducing the AMR burden in Europe and respective countries.
Equipment and materials	• *Internet or Wifi access* • *Computer w/ Microsoft PowerPoint and Excel*

CURRICULUM OUTLINE

Start time	Duration (min)	Topic	Outline	Instructors
PRE-WORK				
Learners can take the following online training: ***Introduction to the GBD online training*** ***Learn how to use GBD***				
DAY 1				
9:00 am	30 min	Introduction to the training school	• Welcome to participants (special address by Prof. Mattia Mori, CA21145 EURESTOP Action Chair) • Introduction to instructors and participants • Review of the workshop schedule, logistics, and specifics • Review the workshop online folder and highlight where teaching materials are located	Dr. Tomislav Meštrović
9:30 am	30 min	Introduction to AMR	• Define AMR • Describe the challenge with AMR globally, regionally, and locally. • Explain the challenges of measuring AMR and issued with data sources/collection • Overview of AMR methodology and workflow • Overview of the AMR estimates and results produced by the GRAM project	Dr. Mohsen Naghavi
10:00 am	30min	GBD Foundations, key concepts, and methods	• Connect GBD results to AMR and explain how they relate, compare, and contrast. Provide examples where relevant. • Purpose of the GBD • Guiding principles of the GBD • Summary measures of health and primary metrics (DALY, YLL, YLD, HALE) • Analytical strategy – high-level overview of the flowchart	Dr. Mohsen Naghavi
10:30 am	15 min	Break		
10:45 am	30 min	GBD Foundations, key concepts, and methods (cont.)	• Connect GBD results to AMR and explain how they relate, compare, and contrast. Provide examples where relevant. • Purpose of the GBD • Guiding principles of the GBD • Summary measures of health and primary metrics (DALY, YLL, YLD, HALE) • Analytical strategy – high-level overview of the flowchart	Dr. Mohsen Naghavi

11:15 am	60 min	Data sources used in the calculation of AMR	• Overview of data sources • Strengths and limitations	Dr. Mohsen Naghavi
12:15 pm	60 min	Lunch		
1:15 pm	60 min	Burden of sepsis and syndromes: Methods and analytical strategy	• Defining sepsis and syndromes in the context of AMR • Data sources used for estimation for sepsis and syndromes • Methodological approaches to estimate sepsis and syndromes	Dr. Mohsen Naghavi / Dr. Tomislav Meštrović
2:15 pm	60 min	Burden of sepsis and syndromes: Practice exercise	• Introduce the case study • Practice exercise on syndromes and sepsis using a practice data set	Dr. Tomislav Meštrović / Eve Wool
3:15 pm		Break		
3:30 pm	30 min	Burden of pathogens: Methods and analytical strategy	• Define pathogens in the context of AMR • Data sources used for estimation of pathogens • Methodological approaches to estimating pathogen distribution	Dr. Mohsen Naghavi / Dr. Tomislav Meštrović
4:00 pm	45 min	Burden of pathogens: Practice exercise	• Practice exercise on pathogens using a practice data set	Dr. Tomislav Meštrović / Eve Wool
4:45 pm	15 min	Wrap-up	• Q&A	
5:00 pm	**END OF DAY 1**			
			DAY 2	
9:00 am	45 min	Prevalence of resistance: Methods and analytical strategy	• Define prevalence • Methods for estimating prevalence • Biases in prevalence data • Trends in antibiotic resistance • Implications for public health	Dr. Mohsen Naghavi / Eve Wool
9:45 am	30 min	Prevalence of resistance: Practice exercise	• Practice exercise on pathogens using a practice data set	Dr. Tomislav Meštrović / Eve Wool
Break	15 min			
10.45 am	15 min	Relative risk: Methods and	• Methods for estimating relative risk • Biases and how to address them	Eve Wool

		analytical strategy		
11:00 am	30 min	Calculation of associated vs. attributable burden: Methods and analytical strategy	• Describe the concept of associated vs. attributable burden • Describe the multiplication methods	Dr. Tomislav Meštrović / Eve Wool
11:30 am	90 min	Lunch		
1:00 pm	90 min	Review of MICROBE visualization tool	• Demonstrate the various features and functions of the microbe tool (review the key findings, infectious syndromes, pathogens, and antimicrobial resistance views) • Demonstrate an example of how the Microbe tool is used ("I do) • Group walkthrough of a different (but similar) example ("we do") • Have learners perform their own exploration exercise ("you do")	Eve Wool
2:30 pm	15 min	Break		
2:45 pm	2.25 hours	Antibiotic stewardship 2:	• Overview of goals of antibiotic stewardship • Using GRAM results to inform benchmarking of hospital antibiotic use • Creating local antibiograms with GRAM results	Dr. Tomislav Meštrović
5:00 pm	**END OF DAY 2**			
DAY 3				
9:00 am	30 min	Using GRAM results to inform policy to reduce AMR burden	• Review of policy options • Evidence reviews • Analytical frameworks • Choice of counterfactuals	Dr. Tomislav Meštrović
09:30 an	60 min	Case study and practical	• Using GRAM results to inform hospital antibiotic use targets	Dr. Tomislav Meštrović
10:30 am		Break		
10:45 am	60 min	Group work	• Using GRAM results to inform implementation of national action plans to reduce AMR burden	Dr. Tomislav Meštrović / Eve Wool

			• Take NAPs and discuss how decisions can be made using GRAM results • Vaccines, hand hygiene, stewardship etc.	
11:45 am	60 min	Summary, demonstration of other GBD Tools and sources	• GBD Results Tool: accessing burden estimates, trends, age-standardized rates, and uncertainty intervals. • GBD Compare: interactive visualization of mortality, DALYs, YLDs, YLLs, risk factors, and geographic variation. • GHDx (Global Health Data Exchange): locating and accessing surveys, surveillance systems, registries, censuses and other data sources underpinning GBD analyses.	Dr. Mohsen Naghavi / Eve Wool
12:45 pm	15 min	Wrap-up	Q&A	
1:00 pm	**END OF TRANING SCHOOL**			