

Competency Development Monitoring Tool

We would like to ask you to shortly state your previous experience (year, name of project) and rate your competencies in each area scoring between 1-5, and if necessary other verbs on the list added at the end of this part which more defines your proximate competence (1 minimum knowledge (aware), 2 experienced/exposed, 3 skilled (independent user), 4 able to teach, 5 expert). This competency assessment is based on main domains of core competencies of EUPHEM programme and activities within the core competencies but consist of more details (sub-domains, activities and methodological examples). When assessing the performance/activities please take to account relation to the main domains and subdomains.

Name: _____ Training Site(s): _____

Core domains				
1. Public Health Microbiology Management and Communication				
Tasks	Competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
1.1 Public Health Management				
General	<u>Define</u> PHM importance <u>Understand</u> principles of scientific communication to peers, stakeholders and media/public <u>Identify</u> public health priorities in Complex emergency situations (CES) <u>Be</u> familiar with security issues <u>Know</u> the role of different agencies <u>Identify</u> elements of stress management			
Interpret and communicate the results	<u>Interpret</u> and <u>evaluate</u> significance of results in support of clinical management and infection control <u>Prepare</u> interpretation and communication strategies that informs the decision making process			
Write a scientific report/ or publish a scientific paper	<u>Provide</u> report in support of patient management, outbreak control and epidemiological support. <u>Write</u> a peer reviewed paper			
Identify a problem of public health importance	<u>Keep</u> updated with relevant issues <u>Review</u> literature <u>Consult</u> Medline			
Knowledge of planning outbreak responses at national and international level	<u>Identify</u> interdisciplinary needs between health care professionals and front line responders. <u>Planning</u> , implementation and lessons learnt from planned exercises.			

Infection control	<u>Plan</u> and <u>implement</u> infection control process within field study			
Response to severe epidemics	<u>Identify</u> key elements of social mobilisation <u>Identify</u> basic laboratory requirements in the field			
Rapid assessment techniques	<u>Use</u> rapid assessment in the early phase <u>Use</u> relevant indicators to monitor intervention <u>Write</u> situation reports			
1.2 Ethics and integrity issue				
Familiarity with ethical roles	<u>Understand</u> and <u>attach</u> to organisational ethics <u>Conduct</u> ethical codes binding the person to her/his principle of collaboration <u>Follow</u> publication ethics <u>Understand</u> and <u>keep</u> personal integrity			
Ethical principles regarding human welfare	<u>When planning</u> studies and / or <u>conducting</u> research: <ul style="list-style-type: none"> • Apply relevant laws to data collection, management, dissemination and use of information • <u>Adhere</u> to ethical principles regarding data protection and confidentiality regarding any information obtained as part of the professional activity <u>Handle</u> conflicts of interests			
1.3 Laboratory management				
Identify best laboratory techniques	<u>Identify</u> appropriate sampling strategies <u>Identify</u> appropriate laboratory investigation and sampling preparation techniques			
Samples transportation	<u>Review</u> and <u>report</u> on the international regulations and the role of stakeholders (i.e. IATA, IACO, Customs,) in movement of infectious materials across national boundaries <u>Outline</u> field microbiology needs and design packaging and transportation protocols			
Rapid assessment techniques	<u>Identify</u> methods for Detection of pathogen/cause of unusual events <u>Design</u> a protocol to grab the laboratory results			
1.4 Communication management				

Conferences	<u>Write</u> an abstract Attend relevant conferences <u>Make</u> an oral presentation <u>Prepare</u> a poster			
Appraise publication	<u>Review</u> manuscript (peer review) <u>Present</u> at journal club			
Peer-reviewed publication	<u>Write</u> a manuscript <u>Build</u> a scientific argument <u>Produce</u> a high level outline of the manuscript <u>Write</u> all sections of an article following the scientific writing structure <u>Submit</u> to peer reviewed journal <u>Undergo</u> editorial process <u>Edit</u> a manuscript after internal review <u>Complete</u> writing a manuscript			
Appraise publication	<u>Review</u> manuscript (peer review)			
Media communication	<u>Prepare</u> a press interview <u>Prepare</u> a radio interview			
2. Applied microbiology and laboratory investigations				
Tasks	competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
2.1 General microbiology				
Microbiology knowledge	<u>Describe</u> role of laboratory in surveillance, outbreak investigation, applied research <u>Understand</u> the principle and practices of bioinformatics and phylogeny <u>Define</u> type of analysis depending on the study design			
Obtain a peer review of the study protocol	<u>Able</u> to seek and take advice into account			
Establish the criteria for microbiological input and evaluation within study team.	<u>Establish</u> microbiological criteria and assessment <u>Design & conduct</u> laboratory investigations in accordance with the documented 'risk assessments'			

Collect data	<u>Create</u> a data entry scheme <u>Record</u> using appropriate IT support.			
Analyse the data	<u>Identify</u> and <u>use</u> appropriate suitable analytical & statistical techniques.			
2.2 Laboratory investigation				
Conduct an investigation	<u>Undertake</u> an laboratory investigation in a public health setting including: <u>Knowledge</u> the principles of: <ul style="list-style-type: none"> - the steps of an investigation - Development of a microbiological case definition - sampling strategies - laboratory techniques - Incident team coordination - environmental procedures - environmental contacts 			
Engage in interaction between different disciplines	<u>Identify</u> needs and objectives of clinicians, laboratory, veterinary and environmental agencies, public and private sector; <u>Think critical</u> in pre-sampling, sampling, analysis, Reporting, documentation, feedback.			
Sample taking	<u>Define</u> a sampling strategy including number of needed samples; <u>Collect</u> , <u>label</u> , <u>package</u> and <u>transport</u> samples appropriately and safely.			
Samples transportation	<u>Review</u> and <u>report</u> on the international regulations and the role of stakeholders; (i.e. IATA, IACO, Customs,) in movement of infectious materials across national boundaries; <u>Outline</u> field microbiology needs and design packaging and transportation protocols.			
2.3 Laboratory methods and analysis				
Knowledge of phylogenetics	<u>Identify</u> and <u>interpret</u> microbiological results and			

	phylogenetic studies required to support epidemiological tracing of infection source.			
Phylogenic analysis	<u>Understand</u> the principles of multiple alignment Construction and <u>interpretation</u> of a simple multiple alignment Phylogenetic analyses techniques <u>Create</u> and <u>query</u> a local BLAST database <u>evaluation</u> of the software and troubleshooting			
Non-sequencing typing methodology	<u>Design</u> and <u>interpret</u> serological, PulseField and VNTR data, etc.			
Sequencing technologies	<u>Preparation</u> and <u>running</u> of automated sequencing systems <u>Critique</u> of the software and troubleshooting Data <u>production</u> and <u>interpretation</u>			
Database systems	Sequence retrieval and simple sequence entry <u>Create</u> a database using BioNumeic and batch sequence import Complex sequence entry: <u>Trace</u> data from automated sequencers <u>Edit</u> sequences by using editing programs(e.g Bioedit) <u>analysis</u> Sequences by using sequence databases			
Engage in interaction between different disciplines (Lab/Epi...)	<u>Identify</u> needs and objectives of clinicians, laboratory, veterinary and environmental agencies Critical thinking in pre-sampling, sampling, analysis, Reporting, documentation, feedback			
Sample taking	<u>Define</u> a sampling strategy including number of needed samples			

	<u>Collect</u> , <u>label</u> , <u>package</u> and <u>transport</u> samples appropriately and safely			
Laboratory methods	<u>Identify</u> key laboratory investigations relevant to selected symptoms and / or suspected pathogens <u>Identify</u> situations where genetic typing methods should be used <u>Estimate</u> sensitivity, specificity, positive and negative predictive value			
Samples transportation	<u>Review</u> and <u>report</u> on the international regulations and the role of stakeholders (i.e. IATA, IACO, Customs,) in movement of infectious materials across national boundaries <u>Outline</u> field microbiology needs and design packaging and transportation protocols			
3. Surveillance and outbreak investigations				
3.1 Surveillance				
Tasks	competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
Plan method	<u>State</u> objectives of surveillance and action / intervention resulting from a surveillance <u>List</u> indicators chosen <u>Identify</u> data needed			
Describe process	<u>Describe</u> type of surveillance <u>Describe</u> data sources <u>Draw</u> a flow chart <u>Evaluate</u> system attributes			
Analyse surveillance data	<u>Perform</u> a capture-recapture study <u>Measure</u> sensitivity of reporting			
Operate microbiological support on surveillance system	Actively <u>participate</u> in the operation of a surveillance system <u>Perform</u> routine analysis of surveillance data			

	<u>Write</u> regular surveillance reports for stakeholders / those who need to know <u>Implement</u> improvements to the system			
Output	<u>Assess</u> feedback procedures <u>Analyze</u> use of information <u>Write</u> a report			
Prevalence Incidence proportion Incidence density Secular trends	Choose free word			
Cohort study design Case control study design Cross-sectional design Ecological studies Case-cohort design Other designs	Choose free word			
Sampling methods Sample size/power calculation Questionnaire design	Choose free word			
Bivariate analysis Stratified analysis Survival analysis Non-parametric methods of analysis Multivariate analysis	Choose free word			
Significance testing Bias Confounding effect modification Standardization Measures of effect Measures of impact	Choose free word			
Causality	Choose free word			
Computers	Choose free word			

Statistical analysis package (SAS, STATA, SPSS) EPIINFO EPIDATA Word processing Graphic package GIS software Other multivariable analysis package Email, WEB				
3.2 Outbreak investigation				
Respond to initial call	<u>Evaluate</u> and <u>record</u> relevant outbreak data set <u>Review</u> and understand on-call protocols <u>Establish</u> response requirements			
Prepare for investigation	<u>Plan</u> the investigation <u>Identify</u> investigation team requirements General knowledge of investigation design			
4. Quality Management				
Tasks	competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
Review international quality guidelines/standards	<u>Understand</u> the principles and practices of quality assurance according to those outlined by international & EU Directives			
External quality assurance (EQA)	<u>Describe</u> efficacy of quality assurance. <u>Assess</u> and <u>experience</u> different standards <u>Understand</u> and <u>apply</u> the concepts of EQA			
Preparing EQA	<u>Collect set of isolates/samples for EQA</u> <u>Write protocols</u> <u>Identify related ISO standards</u>			

Collecting Data	<u>Design template for collecting data</u> <u>Integrate collected data</u> <u>Interpret integrated data</u>			
Preparing report	<u>Crate tables and figures</u> <u>Draft the EQA report</u> <u>Make conclusion and recommendation</u>			
Accreditation Audit	<u>collect data on the origin and type of specimen and the dates and times when</u> (i) <u>the sample was taken</u> (ii) <u>the specimen was received in the laboratory</u> <u>(iii) the report was signed by the microbiologist;</u> <u>(iv) the report was sorted by the laboratory clerical staff</u> <u>(v) The final report was received on the ward</u> <u>Estimate the cumulative time from</u> <u>sampling to a result arriving on the ward</u>			
Accreditation Procedure	<u>Familiar with accreditation procedure</u> <u>Involved in accrediting procedure</u> <u>Responsible for accreditation</u>			
5. Biorisk Management				
Tasks	competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
Review international biosafety guidelines	<u>Understand</u> and apply the principles and practices of biosafety according to those outlined by WHO & EU Directives			
Personal Protective equipment	<u>Describe</u> variation and efficacy of PPE strategies. <u>Assess</u> and <u>experience</u> different PPE systems			

	<u>Understand</u> and <u>apply</u> the concepts of 'Operational protection Factors'			
Decontamination & waste control strategies.	<u>Understand</u> the principles and practices associated with decontamination processes associated with infection control, equipment decontamination etc. <u>Plan</u> and <u>produce</u> decontamination and waste disposal protocols.			
Biosecurity	<u>Understand</u> the principles and practices of biosecurity according to those outlined by WHO & EU & national Directives			
6. Applied PHM Research				
Tasks	Skills/competency	Previous experience	Score (1-5)	Other verbs/ Comments/notes
Study design	<u>Design</u> a research study			
Study protocol/ relevant questions	<u>Identify</u> critical questions <u>Design</u> protocols <u>Exercise</u> realistic timelines <u>Identify</u> limitations <u>Judge</u> possible risks and delays			
Method identification	<u>Identify</u> relevant methods by literature review/discussion with supervisor-colleagues			
Knowledge of relevant methods	<u>Get</u> Familiar with laboratory methods <u>Isolation (culture)</u> (Agar plate/colonies, Liquid media) <u>Identification after culture</u> <u>Perform, Implement, Execute</u> <u>biochemical (physiological) tests</u> <u>Genetic tests (genomics)</u> – PCR Sequencing – Restriction digestion			

	<ul style="list-style-type: none"> - DNA-DNA homology (probes) <p><u>Immunological test</u></p> <ul style="list-style-type: none"> - Antigen detection - ELISA - Hybridization assay - Fatty acid profiling - Protein profiling (proteomics) <p><u>Advance molecular methods</u></p> <ul style="list-style-type: none"> - Microarray - RT-PCR - MOLDI <p><u>Specific diagnostics</u></p> <ul style="list-style-type: none"> - Gram staining - Cell culturing - Antibiotic susceptibility <p><u>Fingerprint-based methods:</u></p> <ul style="list-style-type: none"> - RFLP - PFGE, - AFLP <p><u>Character-based methods</u></p> <ul style="list-style-type: none"> - MLVA Multiple Loci VNTR(Variable Number of Tandem Repeats) Analysis(), - ribotyping, - microarray's <p><u>Sequence-based methods:</u></p> <ul style="list-style-type: none"> - MLST - SNP analysis <p>Bioinformatics-whole genome sequencing analysis etc</p>			
Implementation of new methods	<p><u>Implement</u> new methods in a study</p> <p><u>Identify</u> usefulness of the methods in particular research study</p>			
Trouble shooting	<u>Able</u> to solve technical and practical problems			
Drafting results	<p>Scientific <u>design</u> of the draft</p> <p><u>Make</u> tables and figures</p>			

	<u>Interpret</u> results <u>Present</u> results in a scientific way <u>Discuss</u> the results <u>Draw</u> conclusions <u>Make</u> recommendations			
7. Teaching				
Tasks	Skills/competency	Previous experience	Score (1-5)	Other verbs/ Comments/ notes
Identify training needs	<u>Carry out</u> needs assessment and identify specific initiatives			
Give lectures	<u>Communicate</u> and training for a range of healthcare professionals <u>Define</u> learning objectives <u>Assess</u> own performance through feedback assessments <u>Re-evaluate</u> delivery and content			
Moderate case studies	<u>Moderate</u> a case study <u>Guide</u> participants to the answer <u>Explain</u> epidemiological/microbiological/clinical concepts surrounding the disease or outbreak			
Plan and organise a course	<u>Plan</u> training activities as: <u>Define</u> course objectives <u>Outline</u> learning outcomes <u>Describe</u> core competences <u>Develop</u> curriculum <u>Identify</u> teaching and assessment methodologies <u>Adopt</u> training tools <u>Develop</u> a reflective learning strategy <u>Create</u> an assessment survey			
Pedagogical teaching	<u>Give</u> lectures (with discussion, etc.)			

	<u>Perform</u> interactive teaching and learning methods as: Problem Based Learning (PBL), Case Studies, Panel of Experts, Cooperative Learning, Project Based Learning, Brainstorming, etc. <u>Manage</u> adults groups <u>Design</u> case study <u>Prepare</u> presentations			
Give and direct a seminar	<u>Deliver</u> seminar to multidisciplinary audience Record reflective learning			

List of actions verbs

	A	B	C	D	E	F
1	count	associate	Add	analyse	categorize	generate
2	define	Compute	Apply	Arrange	Combine	plan
3	Describe	convert	Calculate	Breakdown	Compile	produce
4	Draw	Defend	Change	Combine	Compose	assemble
5	Identify	Discuss	Classify	Design	Create	construct
6	Labels	Distinguish	Complete	Detect	Derive	create
7	List	estimate	Compute	Develop	Design	design
8	Match	explain	Demonstrate	Diagram	Devise	develop
9	Name	Extend	Discover	Differentiate	Explain	formulate
10	Outlines	Extrapolate	Divide	discriminate	Generate	change
11	point	Generalize	Examine	Illustrate	Group	Combine
12	quote	Give	Graph	Infer	Integrate	Hypothesize
13	read	Infer	Interpolate	Outline	Modify	Predict
14	Recall	Paraphrase	Interpret	point out	Order	Invent
15	Recite	Predict	Manipulate	relate	Organize	improve
16	recognize	rewrite	Modify	Select	Plan	
17	Record	summarize		Separate	Prescribe	
18	Repeat	Examples		Subdivide	Propose	
19	Reproduces			utilize	Rearrange	

20	Selects				Reconstruct	
21	State				Relate	
22	Write				Reorganize	
23	duplicate				Revise	
24					Rewrite	
25					Summarize	
26					Transform	
27					specify	
28					Appraise	
29					Assess	
30					Compare	
31					Conclude	
32					Contrast	
33					Criticize	
34					Critique	
35					Determine	
36					Grade	
37					interpret	
38					Judge	
39					Justify	
40					Measure	
41					Rank	
42					rate	
43					support	
44					test	