

ECDC Fellowship Programme

Public Health Training Section

Manual for the ECDC Fellowship Programme EPIET and EUPHEM paths

This manual has been written by the ECDC Fellowship Programme team, based on previous editions, and reviewed by the Head of Fellowship Programme, Chairs and Co-chairs of EPIET and EUPHEM in the Training Site Forum (TSF), EPIET Associated Programmes (EAP) and ECDC Fellowship Scientific Coordinators.

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Abbreviations

EAN	EPIET alumni network
EAP	EPIET-associated programme
ECDC	European Centre for Disease Prevention and Control
EEA	European Economic Area
EPIET	European Programme for Intervention Epidemiology Training
ESCAIDE	European Scientific Conference for Applied Infectious Disease Epidemiology
TSF	Training Site Forum
EUPHEM	European Public Health Microbiology Training
EU	European Union
EU-track	European Union -track of EPIET/EUPHEM (fellows trained in a country other than their country of citizenship/s)
EVA	ECDC Virtual Academy (e-learning platform)
FETP	Field epidemiology training programme
FFO	Fellowship Faculty Office (ECDC)
MS-track	Member State-track of EPIET/EUPHEM (fellows trained in their country of residence)
PAE	German postgraduate training for applied epidemiology
PHT	Public health training (ECDC)

1 Background and purpose

The European Programme for Intervention Epidemiology Training (EPIET) was created in 1995. Its purpose was to create a network of highly trained field epidemiologists in the European Union (EU), thereby strengthening the public health epidemiology workforce.

In 2006, EPIET was integrated into the core activities of ECDC. The practical training continues to take place at national and regional centres for surveillance and control of communicable diseases, including public health laboratories in the EU and European Economic Area (EEA) Member States. The legal basis of this Administrative Decision lies in Article 9 (6) and Article 5 (3) of Regulation (EC) No 851/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European Centre for Disease Prevention and Control (the ECDC Founding Regulation).

ECDC initiated the European Public Health Microbiology Training Programme (EUPHEM) in 2008. It provides training and practical experience in public health microbiology at national and regional centres for surveillance and control of communicable diseases, laboratories with public health functions or training sites with a consortium of laboratories in the Member States of the EU/EEA.

The ECDC Fellowship Programme works in close collaboration with several EPIET-associated programmes. These programmes are field epidemiology training programmes (FETP) run and governed by the Member States, currently including the German postgraduate training for applied epidemiology (PAE). EPIET and EPIET-associated programmes share scientific content based on the curriculum of EPIET and collaborate based upon agreements between ECDC and the programmes themselves. In this manual, experts responsible for EPIET-associated programmes are designated as 'EAP scientific coordinators' even though titles may differ by country (e.g., scientific coordinator, senior scientific coordinator, director).

Current EPIET/EUPHEM and EAP alumni provide expertise in response activities and strengthening capacity for communicable disease surveillance and control inside and beyond the EU.

1.1 Purpose and users

This manual provides a detailed overview of the ECDC Fellowship Programme's intended learning outcomes, training activities (modules, field- and international assignments), supervision and scientific coordination.

The intended audiences of the manual are all active fellows of the ECDC Fellowship, candidates to the ECDC Fellowship, training site supervisors, and the Scientific Coordinators. The manual is a living document that may be updated during the fellowship. Supervisors and fellows will be informed of any changes to the manual. During 2022 and 2023, work is ongoing for updating the core competencies and curriculum of the Fellowship Programme, and therefore considerable updates to the current manual are anticipated during 2023.

The manual also makes reference (in annexes) to other documents – e.g., core competencies for EPIET/EUPHEM fellows and standard operating procedures (SOPs) etc.

2 Programme objectives

According to the Administrative Decision on 'Rules governing the EU-track of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM)' for Cohort 2023, the Fellowship Programme has the following **programme objectives**:

- To contribute to strengthening the prevention, preparedness, surveillance and control of infectious diseases and other cross-border health threats or issues of public health concern in the EU/EEA Member States and at EU level, supporting the implementation of Decision 1082/2013/EU
- To contribute to enhancing response capacities for effective field investigation and communicable disease control at European, national and community level to meet public health threats, in particular for the EU response to cross-border threats to health
- To contribute to strengthening the European and global network of public health professionals through the use of state-of-the-art, shared standards and methods, good practices and common public health objectives
- To contribute to knowledge transfers and capacity building within and between Member States;
- To facilitate innovative inter-disciplinary and multi-sector cooperation and communication to achieve the above objectives while adjusting to emerging needs
- To contribute to the reduction of disparity across Europe in the prevention, preparedness, surveillance and control of communicable diseases

3 Competencies and intended learning outcomes

The Programme consists of relevant and practical learning ('learning by doing') in public health practice, based on discipline-specific core competencies (Annexes 01 and 02). Fellows begin the programme with an introductory course. Specialised modules during the fellowship offer further training opportunities to develop core competencies. The Programme, or the training sites, may offer additional training opportunities if other learning needs are identified.

3.1 Core competencies

The ECDC Fellowship Programme is a competency-based programme. The curriculum for discipline-specific paths is based on core competencies developed in consultation with relevant stakeholders.

A competency is a combination of **knowledge, skills** and **abilities/attitudes** considered critical to performing a task effectively.

The competency-based learning objectives in this document comprise both generic and discipline-specific competencies. The minimum expected level for fellows to achieve during the fellowship is indicated for each key competency domain:

Aware (basic): Individuals are able to identify the concept but their ability to perform the task/s independently is limited.

Skilled (intermediate): Individuals are able to perform tasks independently.

Competent (advanced): Individuals are able to apply, appraise and teach the acquired skills.

Individual fellows' competencies are assessed at the beginning of the programme, and their acquisition is assessed during the course of the programme.

The Fellowship Programme uses the core competencies as a reference framework to:

- Define the pre-requisites for selecting candidates
- Determine the objectives to be achieved within the two-year fellowship (with input from the TSF)
- Develop, organise, and update the curriculum, including modules
- Monitor the progress of individual fellows and aid the planning of learning activities.

3.2 Programme-common intended learning outcomes

The Fellowship learning activities are grounded in the fellows' service in public health settings, mostly at epidemiology departments or laboratories with a public health function. During the two-year training programme, all fellows work to reach the following common **intended learning outcomes**.

The expected level of competency for each learning activity is indicated by its verb (design, analyse, conduct, etc.). Each of the headings in this section indicates a **key competency domain or complex learning activity**, with the expected competency level presented in parentheses. In some cases, the learning outcome may be accepted as achieved regardless of the level. For example, depending on previous experience, opportunities available for projects and the combination of interest and dedication to a certain assignment, the learning outcome could be either 'skilled' or 'competent' in some domains.

Given the nature of the field assignments, the modules undertaken, and the baseline levels of competence at recruitment, it is likely that field epidemiology and public health microbiology path fellows will reach different levels of the common competencies during their fellowship.

Domain	Competency	Activities
Surveillance	(skilled/competent)	<ul style="list-style-type: none"> • Design and implement surveillance systems (including syndromic, event-based, and/or laboratory-based systems) • Analyse surveillance data, interpret them to generate information for action and write a surveillance report • Evaluate an existing surveillance system • Provide epidemiological and public health microbiological advice on improvement or maintenance of surveillance systems

		<ul style="list-style-type: none"> Combine epidemiological and microbiological knowledge and information in surveillance systems for unusual events.
Outbreak investigation	(skilled/competent)	<ul style="list-style-type: none"> Conduct or play a key role in outbreak investigation/s and contribute to the investigation with specific epidemiological and/or microbiological skills.
Applied public health research	(competent)	<ul style="list-style-type: none"> Conduct all stages of research projects, from planning to writing a scientific report.
Public health microbiology and laboratory investigations	(aware (EPIET)) (competent (EUPHEM))	<ul style="list-style-type: none"> Apply concepts of virology, bacteriology, parasitology/mycology and immunology to public health disciplines Determine the use and recognise the limitations of diagnostic and typing methods Interpret the results of diagnostic/typing methods for patient diagnosis, outbreak investigations, surveillance and epidemiological studies Recognise specific issues related to the use of laboratory methods in investigations of rare and emerging diseases Design and/or apply safe sampling strategies for disease surveillance and for outbreak investigation and control, in humans, animals, and the environment.
Management and communication	(aware/skilled)	<ul style="list-style-type: none"> Apply the communication standards of local, national and international organisations involved in infectious disease control Assess risks of response to a potential health threat caused by communicable disease Coordinate response through use of communication mechanisms and other tools Communicate effectively with multidisciplinary professional teams, health authorities, the public and the media in the form of publications, reports, interviews, and oral presentations.
Training and teaching	(skilled/competent)	<ul style="list-style-type: none"> Identify training needs in a target group Plan and organise training events Design and develop training materials, including case studies based on previous experience (i.e., surveillance systems, outbreak investigation and epidemiological studies) Facilitate case studies Demonstrate awareness of adult learning principles and pedagogical techniques in training delivery Plan and conduct evaluation of training.
Statistical analysis	(skilled/competent)	<ul style="list-style-type: none"> Demonstrate knowledge of the principles and processes of statistical analysis and use of related software Apply concepts of probability and statistical inference Use the statistical modelling methods and components appropriate to the study objective /design (e.g., multivariable logistic model, time series analysis) Manage confounding and effect modification at the analytical level Interpret the results of the statistical modelling.
Laboratory quality management	(aware (EPIET)) (skilled/competent (EUPHEM))	<ul style="list-style-type: none"> Describe quality assurance in the lab Assess different laboratory standards Apply the concepts of external quality assurance (EQA) Perform, evaluate or analyse results of an EQA Perform an internal audit of a laboratory in relation to international standards.

<p>Bio-risk management</p>	<p>(aware (EPIET)) (skilled (EUPHEM))</p>	<ul style="list-style-type: none"> • Demonstrate understanding and application of national, European and World Health Organization (WHO) rules and regulations regarding biosafety and biosecurity • Demonstrate understanding of how biosafety/biosecurity rules and regulations may influence response to a public health event • Demonstrate knowledge of the appropriate use of decontamination strategies/ personal protection in field settings • Determine the need for quality management, biosecurity management, and crisis response as core elements of management of a public health microbiological laboratory.
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4 Content of the programme

4.1 Introductory course

Early in the fellowship, all fellows attend a mandatory introductory course that provides an introduction to intervention epidemiology and public health microbiology to prepare them for field work.

4.2 Training modules

Fellows attend several additional training modules relevant to field assignments and core competencies, organised by the Programme in collaboration with EAP partners. The content of the modules is intended to address the competency-based learning objectives of the programme and to support the ongoing acquisition of competencies through practical learning at the training site. Modules are also opportunities to develop the network and engage training site supervisors.

The modules form an integral part of the fellowship, and fellows are expected to attend all modules for their entire duration. Non-attendance should be justified, and fellows are to seek pre-approval by the Head of Fellowship Programme/Director of the EAP programme. Fellows should inform the Fellowship Faculty Office (FFO) immediately if they are unable to attend (EPIET.Office@ecdc.europa.eu).

The module scheduling and curriculum may be subject to changes in content or format in response to emerging issues and results from evaluations of previous editions.

In a true spirit of *learning by doing*, the modules are a complement to the main component of the training: the projects and field assignments. Modules offer an opportunity to update knowledge, skills and competencies; allow for support from coordinators and facilitators, and exchange experience among peers.

If one or more training objectives are not met, instead of receiving the diploma, the fellow receive ves a certificate of completion related to the activities conducted during the fellowship.

4.3 Field assignments

To develop the required competencies, fellows engage in a number of field assignments (projects) based on their own learning needs and the public health service needs of the training sites. The Fellowship Programme uses a number of quality standards to evaluate these outputs and determine whether field assignments are satisfactory and aligned with programme objectives.

Throughout the two-year fellowship, supervisors, frontline coordinators and fellows are encouraged to select projects to cover technical issues that best complement the fellow profile.

Fellows are instructed to share protocols and draft reports related to each project at an early stage with local/project supervisors and frontline coordinators, to allow for technical review and to ensure alignment with programme objectives.

Fellows are required to develop a short project proposal for planned field assignments, stating background, objectives, learning objectives, work plan (methodology), and proposed outcomes including public health importance, local/national/EU added value, and evidence for decision-makers (Annexes 04A and 04B). This proposal should also outline specific supervision for each project and must be approved by the frontline coordinator before initiation of the assignment. Given their urgency, outbreaks may be exempt from this requirement.

4.3.1 Outbreaks

Outbreak investigations are among the most stimulating and challenging activities for fellows, due to time pressure, possible public attention, and the need for scientific and technical rigour.

Description of the assignment

Fellows are expected to be actively involved in all stages of an outbreak investigation, preferably at a frontline site, from initial detection and characterisation to dissemination of findings and recommendations. Upon completion of the fellowship, fellows will have conducted at least one outbreak investigation with an epidemiological component, and in a key role actively contributed to all steps of the investigation. Experience may be acquired by working on several outbreaks, with various levels of responsibility.

Descriptive and analytical epidemiological and microbiological investigations are desirable in order to develop relevant competencies.

Output/deliverable

To complete the outbreak assignment, fellows are required to produce at least one final outbreak report (Annex 05 or the Institute's template) or a peer-reviewed manuscript of an outbreak. In case the fellow uses the Institute's template for the outbreak report, the role of the fellow must be briefly described, either in the report or the IPR. Submitting findings for presentation at a scientific conference, and/or a manuscript to a peer-reviewed journal as first author, is highly encouraged. A shared report would be allowed as an output for two fellows if the contribution of both is described and considered sufficient by the Head of the Fellowship Programme and frontline coordinators.

4.3.2 Surveillance projects (design, implementation, data analysis or evaluation)

Communicable disease surveillance systems depend on epidemiological and laboratory data. Public health epidemiologists and microbiologists must be able to set up and/or manage ongoing surveillance system activities, and to evaluate surveillance systems including the role of the laboratory. The pedagogical objective of this activity is to acquire competencies in the design and implementation of a new system, and/or analysing data from an existing surveillance system, and/or evaluating a surveillance system, by system objective and attributes. This activity is intended to support the training site in interpreting surveillance data with consideration for its strengths and limitations, and in using information from surveillance systems for public health action.

Description of the assignment

The surveillance project includes at least **one** of the following:

- Design or implement a new surveillance system, by:
 - designing the surveillance system (public health importance, action/intervention available, objectives of the system, case definition, indicators, data collection, information sources, transmission of information, software and hardware, data analysis, feedback procedures, recipients, use of information)
 - developing a case report form and obtaining clearance from appropriate individuals or offices
 - obtaining support for the surveillance system from the individuals who will be responsible for ensuring that the system is implemented
 - conducting a pilot study if necessary

OR
- analyse and interpret data from a surveillance system to generate information for action, by:
 - appraising surveillance data for quality
 - interpreting trends in the surveillance data and developing corresponding recommendations
 - participating in regular feedback of surveillance data to stakeholders
 - writing a scientific report using the analysed data
 - making appropriate recommendations for the improvement of the surveillance system, including further investigation, improved processes, or prevention or control measures

OR
- evaluate an existing surveillance system, by:
 - describing the public health importance of the health event under surveillance, and the public health objectives related to the health event
 - describing the system, including the resources required to operate it
 - selecting relevant criteria for evaluation (simplicity, flexibility, acceptability, sensitivity, positive predictive value, representativeness, timeliness) and defining methods to assess these criteria
 - evaluating the system for relevant criteria
 - formulating conclusions and recommendations

All fellows should be involved in routine surveillance.

Output/deliverable

To complete the surveillance assignment, fellows are required to produce, when applicable, a protocol for the surveillance assignment (usually for designing or evaluating surveillance systems) and either a final report or submit a manuscript on the outcomes of the surveillance project for publication in a peer-reviewed journal.

4.3.3 Applied public health research

Applied public health research allows fellows to apply epidemiological and microbiological knowledge and practice to address relevant public health questions. The pedagogical objective of this activity is to acquire the skills necessary to plan and conduct a public health epidemiology and/or microbiology study, to analyse data, and to interpret and communicate results.

Fellows will identify one or more research projects in collaboration with the training site supervisor. Projects should be driven by the public health needs of the training site and not be merely academic research.

Description of the assignment

Fellows will conduct an Applied public health research project that includes:

- Assessing information needs
- Framing a research question
- Formulating epidemiological/public health microbiological objectives
- Outlining the analysis plan
- Writing a complete study protocol
- Seeking ethical approval (if necessary)
- Preparing the data collection instrument (e.g., questionnaire) or laboratory methods
- Collecting, collating and cleaning data
- Analysing data
- Formulating conclusions
- Proposing recommendations
- Engaging stakeholders in next steps (for example, further research and public health recommendations).

Applied public health research projects involving human subjects that require ethical committee clearance must be subject to these procedures, in accordance with the rules and regulations of the training site.

Frontline coordinators and supervisors play a key role in discussing evidence-based interventions in response to epidemiological findings.

Output/deliverable

To complete the Applied public health research assignment, fellows must deliver outputs documenting their involvement in all aspects of. Since research may take more time than the duration of the fellowship, this may be done through more than one project (e.g., writing a protocol for a study that will be implemented by others, and analysing data generated from a protocol developed by others, to write a report or paper). The final outputs will include:

- A final study protocol AND
- A final report AND/OR a presentation at a scientific conference, AND/OR a manuscript submitted to a peer-reviewed journal

4.3.4 Training and teaching public health professionals

Cascading of knowledge through teaching is a cornerstone of the ECDC public health training strategy. By engaging in the training of other public health professionals, fellows develop skills in adult education, applying appropriate teaching and evaluation methods.

Description of the assignment

The aim of the training assignment is to develop and employ learning tools using pedagogical techniques suitable for adult learners.

This will include:

- Defining learning objectives

- Designing and preparing learning materials (e.g., interactive lecture, case study, short course or workshop design)
- Delivering and evaluating learning activities

Outputs/deliverable

To complete the teaching assignment, the fellow must develop new or revise existing training materials, engage in active teaching/training (i.e., not just deliver a lecture), promote the evaluation of their teaching/training activity, and produce at least one reflective report or note on the training activities conducted (e.g., results of the training evaluation, summary of the instructional design process, reflection on delivery of content and interaction with learners, reflection on what could have been done differently).

4.3.5 Management and communication

Management in public health setting is defined as the capacity to identify and prevent/control threats to the health of the public caused by communicable diseases or their products (e.g., toxins), and to formulate evidence for policies and strategies that support improvement of the population's health.

Communication skills include diverse levels of communication (local/national and international) and different modalities (scientific, technical and risk communication). Communication of public health epidemiology and microbiology information is a crucial task for appropriate public health action. Effective communication and coordination of efforts and investigations among different professionals and disciplines involved is essential.

The aim of the communication assignment is to communicate effectively with other public health professionals and authorities involved in decision-making for public health interventions.

Management skills expected to be developed during the Fellowship

Knowledge of planning outbreak responses at national and international level

- Identify public health priorities in complex emergency situations
- Recognise security issues
- Know the role of different agencies
- Identify elements of stress management
- Identify interdisciplinary needs between health-care professionals and front-line responders

Infection control

- Plan and implement infection control processes within field studies

Response to epidemics of severe nature

- Identify key elements of social mobilisation
- Identify basic laboratory requirements in the field

Team building and negotiation

- Be an effective team member, adopting the role needed to contribute constructively to the accomplishment of tasks by the group
- Promote collaborations, partnerships and team building to accomplish public health microbiology programme objectives
- Develop community partnerships to support epidemiological and microbiological investigations
- Mutually identify those interests that are shared, opposed or different with the other party to achieve good collaborations and conflict management

Ethics and integrity issues

- Integrate with the ethical rules related to the work of the fellows
- Adhere to organisational ethics, as well as other ethical codes binding the person to the principle of collaboration, publication ethics, and personal integrity
- Respect and adhere to ethical principles regarding human welfare when planning studies, conducting research, and collecting, disseminating and analysing data
- Apply relevant laws to data collection, management, dissemination and use of information
- Adhere to ethical principles regarding data protection and confidentiality regarding any information obtained as part of professional activity
- Handle conflicts of interests

Description of the assignment

Public health management experience may be summarized in the fellowship portfolio. Fellows are required to communicate the results of their field (outbreak) investigations, surveillance projects, research projects, applied public health microbiology, laboratory investigation, biorisk management and/or quality management projects to public health authorities or policy makers by producing written technical reports, briefings or other effective (oral and written) communication outputs.

Fellows may communicate with the scientific community by:

- Writing and submitting abstracts to the European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) or similar international conferences
- Writing and submitting short article/s in /epidemiological/ microbiological bulletin/ journal
- Writing and submitting (as first or last author) a scientific paper for an international, peer-reviewed journal
- Presenting in oral or poster sessions at an international conference
- Appraising a scientific abstract/article
- Reviewing scientific communication of others and giving constructive feedback
- For presentations at local conferences where the language is not English, the abstract will be drafted in English then translated once the content has been agreed by the supervisor and frontline coordinator

Fellows may also communicate with the media and the general public by:

- contributing to the preparation of a press release
- responding to interview requests (newspaper, radio or TV) if appropriate
- engaging in social media
- preparing a questions and answers briefing (frequently asked questions), or a 'media lines' document on a public health issue

For any communication related to the Fellowship Programme by a fellow to the general public and media, clearance needs to be obtained from ECDC via the Head of Fellowship Programme prior to publication.

Output/deliverable

To complete the scientific communication assignment, fellows must:

- Submit at least one abstract to ESCAIDE or a similar international conference (as first author)
- Give at least one oral (Annex 06A) or poster presentation (Annex 06B) during a structured, moderated session at an international, peer-reviewed, English-language conference, primarily ESCAIDE. Subject to budget availability¹ and first authorship of the fellow, other relevant conferences may be identified (e.g., Global/Regional Conference of Training Programs in Epidemiology and Public Health Interventions Network (TEPHINET), or European Congress of Clinical Microbiology and Infectious Diseases (ECCMID)). Fellows are encouraged to apply for funding from the conference organizers. The training site may identify and fund relevant conferences for the fellow.
- Submit at least one English language manuscript, as first or last author, which has been reviewed/approved by scientific coordinator/s, to an international peer-reviewed journal (preferably open-source and indexed in Medline). On a case-by-case basis first authorship may be shared with another author (preferably another fellow), if scientific quality and work amount needed for the project is sufficiently extensive and that the contribution of the fellow is distinguishable and described.

4.3.6 Bio-risk management

The scope of bio-risk management is to apply requirements necessary to control risks associated with the handling, storage and disposal of biological agents and toxins in laboratories and facilities.

Description of the assignment

For EUPHEM and when relevant for EPIET, fellows are expected to apply bio-risk management rules in controlling or minimising the risk to acceptable levels in relation to employees, the community, and others as well as the environment, which could be directly or indirectly exposed to biological agents or toxins. Fellows should understand and apply protocols on appropriate laboratory investigations and sampling preparation techniques based on the WHO manual on biorisk management (<https://www.who.int/publications/i/item/9789240011311>), including being able to:

- Assess the use of international regulations (i.e., International Air Transport Association (IATA), International Civil Aviation Organization (ICAO), customs) in movement of infectious materials across national borders
- Apply protocols on packaging and transportation of dangerous goods
- Apply protocols on methods for detection of pathogen/cause of unusual events

¹ Before submitting an abstract to any conference other than ESCAIDE, fellows must ensure that it is approved by the Head of Fellowship Programme and that there are funds available to attend the conference.

Output/deliverable

To complete the assignment, the fellows must have worked (prior to fellowship or else during fellowship) for at least 3 weeks in a BSL3 and/or BSL4 laboratory and record this in the EUPHEM matrix.

4.3.7 Laboratory Quality Management

In laboratory medicine, control measures are essential for diagnosis, risk assessment, examination and treatment of patients. Methods applied in diagnostic approaches must be accurate, precise, specific and comparable among laboratories. Insufficient or incorrect analytical performance has consequences for the patients, the healthcare system and subsequently for the health of the public.

Description of the assignment

To ensure reliability, reproducibility and relevance of laboratory test results, quality management programmes are essential. For EUPHEM and when relevant for EPIET, fellows are expected to organise/participate in an external quality assessment (EQA) and internal quality control (IQC). In addition, fellows are expected to undertake/participate in a laboratory audit in accordance with international standards and using the *Bioframe* programme. During the two years, fellows must participate in or organise at least one accreditation process of a laboratory or a method.

Output/deliverable

- An EQA report or published paper
- An audit report
- An accreditation report

4.3.8 Applied microbiology and laboratory investigation

Applied microbiology is the understanding of the basis and limitations of laboratory methods and the application of these methods in a public health setting (e.g., outbreaks, surveillance, complex emergency situations, and unusual events). This includes general microbiology, laboratory investigation, laboratory methods and analysis, and could be part of an outbreak investigation, as described under the programme for common field work.

Description of the assignment

Fellows are expected to conduct laboratory investigation/s during the fellowship. This includes (for EUPHEM and when relevant for EPIET):

- identifying key laboratory investigations relevant to selected symptoms and/or suspected pathogens
- collecting, labelling, packaging and transporting samples appropriately and safely
- identifying needs and objectives of clinicians, veterinary and environmental agencies in the public and private sector in relation to laboratory investigations
- defining the type of microbiological analysis depending on the study design
- defining a sampling strategy including number of needed specimens
- giving advice in pre-sampling, sampling, laboratory analysis, reporting, documentation, feedback
- performing evaluation studies of diagnostic test accuracy (sensitivity, specificity, positive and negative predictive value)

Output/deliverable

To complete this assignment, the fellows need to deliver outputs documenting their involvement in different aspects of laboratory investigation (e.g., writing a protocol, producing a report, guidelines, line-list or a manuscript).

4.5 Matrix of EUPHEM

The matrix for the EUPHEM training is planned both vertically and horizontally (Annex 07). The horizontal part of the matrix contains seven core competencies (eight domains). Different disease groups are distributed on the vertical axis. The fellow must complete at least four main field assignments. Three are mandatory – in outbreak investigation, surveillance and research. The fourth can be selected from any other competency domain (applied public health microbiology and laboratory investigation, biorisk management or quality management). Fellows are encouraged to select assignments in different disease groups, as this will contribute to broader skill development across disease programmes. Each project should result in an output in the form of a manuscript, guidelines or a report. However, a fellow might have an outbreak investigation project in the same disease group as other projects due to the unpredictability of outbreaks. Public health microbiology management and teaching can also be covered

in any of the disease groups, without limiting the possibility of additional projects in the same area. In addition to projects, fellows will have additional activities that can be allocated to any disease group.

If a fellow has previously worked in one specific disease group, it is recommended that other disease areas should be chosen for the fellowship projects. However, fellows may provide their subject matter expertise when requested and in the interest of the training site (e.g., outbreak investigation). Fellows may contribute up to 20% in the same subject or disease group as before the fellowship in the form of service to the training site in the event of emergencies or outbreaks.

4.6 Annual ESCAIDE conference and other scientific conferences

Fellows participate at the annual ESCAIDE. Fellows are expected to submit abstracts and present the results of their projects at this conference.

Fellows can participate in other national or international scientific conferences if their supervisors and frontline coordinators consider them suitable in the context of their learning objectives. Before submitting any abstract to a conference, fellows must seek the approval of their training site supervisors and EPIET/EUPHEM/EAP scientific coordinators or, in the event of international assignments, from the requesting agency (see Annex 03. Guidelines for scientific outputs).

Subject to budget availability, the Programme may fund fellows' participation to other conferences, and will assess priorities and availability of budget on a case-by-case basis.

4.7 Projects tackling EU cross-border health threats and International assignments

Collaborative projects tackling EU cross-border health threats are a priority of the Fellowship programme. International organisations or agencies, non-governmental organisations (NGOs), and research agencies/institutes may also request assistance and offer fellows opportunities to carry out field work in an international setting, outside of their usual training site. ECDC/EAP fellows may participate in these activities, when the proposed assignments offer an experience appropriate to the training objectives, but it is not a compulsory activity. The duration of the international assignment may vary depending on the project. It should last 4-6 weeks and, under special circumstances, may last up to 8 weeks, regardless of being on site or remote. A standard operating procedure for international assignments (Annex 08, under consultation and subject to change) governs the conditions under which fellows are deployed. For international assignments identified and organised by training sites, similar procedures apply.

5. Roles and Responsibilities

5.1.1 Head of Fellowship Programme

The Head of Fellowship Programme (EPIET and EUPHEM), based at ECDC, leads scientific and managerial aspects of the Fellowship Programme in consultation with EAP directors and reports to the Head of the Public Health Training (PHT) Section at ECDC. Under the guidance of the Head of Section, the Head of Fellowship Programme leads the implementation of the scientific, structural and administrative development work of the ECDC Fellowship Programme (EPIET/EUPHEM) based on the [external evaluation](#) of the programme and the new ECDC strategy.

The Head of Fellowship Programme leads the work of the scientific coordinator team based at ECDC and in the Member States and ensures that fellows achieve their training and learning objectives, and facilitates regular communication between the scientific coordinator team, fellows and supervisors. This teamwork includes: identifying new potential training sites and organising initial site appraisals and regular site visits to existing training sites; facilitating opportunities for fellows to participate in international assignments, determining the suitability of international missions and monitoring of fellows' progress during the assignment; implementing and developing the specialised training modules, including syllabus and identifying suitable facilitators. The Head of Fellowship Programme (or, in his absence, another senior staff member within ECDC), also chairs the EPIET and EUPHEM selection committees in the Selection Process.

In the event of conflicts between the fellow and the site supervisor, the Head of Fellowship Programme will adopt a moderating role. The Head of Fellowship Programme and the fellow's main supervisor sign the fellow's diploma.

5.1.2 Fellowship scientific coordination team

The Fellowship scientific coordination team implements and manages the technical curriculum and programme delivery, jointly with the scientific coordinators of the EPIET-associated programmes (EAP). The scientific coordinators provide expertise in epidemiology and public health microbiology, support fellows and supervisors, develop training materials and organise training modules throughout the fellowship. The coordinators are also

responsible for ensuring that projects have public health relevance and are aligned with core programme competencies. The Fellowship scientific coordinators act as one team to ensure quality, monitor the achievement of learning objectives and outcomes, and collaborate to meet the scientific needs of all fellows, irrespective of path.

The scientific coordinators report for functional purposes to the Head of Fellowship Programme on all content-related matters. The Head of Fellowship Programme monitors the implementation of their scientific activities.

Scientific coordinators for the EPIET-associated programmes are responsible for EAP fellows.

Working in the context of the technical reference of this ECDC Fellowship Manual, the broad activities of the Scientific Coordinators are:

- Frontline coordination (see section 5.1.3 for details on frontline coordination)
- Implement and develop training programme content and methods (e.g., facilitating and leading organisation of training modules)
- Develop and update documents describing training objectives of the fellowship (i.e., surveillance, outbreak investigation, applied public health research, communication and teaching, etc.) according to the respective core competencies
- Develop training skills and techniques among current and potential trainers and supervisors at hosting training sites, including training the trainers
- Contribute to continuous quality improvement of the fellowship programme and support administration of the programme when relevant

5.1.3 Frontline coordination

Each fellow is assigned to a scientific coordinator who is their 'frontline coordinator'. Frontline coordinators will be part of a triangular interaction with the fellow and the training site supervisors. However, the frontline coordinator may identify a need for specific expertise and engage other coordinators for input on individual projects.

The specific role of the frontline coordinators is to provide support to both fellows and supervisors by:

- Liaising regularly with the training site supervisor and fellow to ensure that the programme's training objectives are met
- Monitoring the acquisition of core competencies by fellows during the fellowship by using the competency assessment tool (Annex 10A and 10B)
- Guiding fellows and supervisors in selecting suitable assignments, including reviewing and approving project proposals
- Regularly organising meetings or phone calls with supervisors and fellows to discuss progress and address questions or doubts
- Monitoring training progress through review of the monthly IPR, at the mid-term review and at exit review
- Reviewing early draft versions of fellow's projects and scientific outputs (e.g., protocols, reports, manuscripts and presentations) for technical and editorial feedback. In general, the Training Site supervisor(s) have the main responsibility and final say of the scientific outputs and project proposals of the fellow.
- Supporting fellows to identify relevant literature and background information to assess a public health issue
- Facilitating exchange of information and projects between fellows
- Responding, or identifying appropriate respondents, to queries from fellows

5.2. Training sites and supervisors

5.2.1 Training sites

Fellows are placed at training sites that have a mandate to work on communicable disease surveillance, outbreak response, epidemiology or/and public health microbiology and the provision of public health advice at international, national and sub-national level in the EU/EEA countries. In order to become an acknowledged training site, all sites need to undergo a first training site appraisal and subsequent regular site visits.

Training sites must offer the following:

- Access to field epidemiology (outbreak investigation, preferably in a frontline site, surveillance) or/and public health microbiology activities and data sets as detailed in the site appraisal/visit guide
- Technical and personal on-site supervision by a team of at least two field epidemiologists/public health microbiologists, for an average of at least four hours per week per fellow throughout the training
- Adequate working space and communication facilities for the fellow, including PC or laptop; access to international telephone, fax, internet, and an institutional e-mail address; access to library facilities or institutional online access
- Access to statistical support (not necessarily on site, possibly through academic links)

- Commitment to share all outputs of the fellow, including early drafts, equally between fellow, supervisors and coordinators (documents are treated as confidential)
- Administrative support that includes a dedicated focal point for contractual issues and provision of funds for travel within country to support outbreak investigation and control
- Collaboration with epidemiological and microbiological sectors, as well as environmental and animal health sectors
- Ensuring biosafety and biosecurity of the laboratories that fellows will work in
- Sufficient time set aside for the fellow to engage in fellowship-related activities, as the fellowship is a full-time training programme

Training sites commit to working with the ECDC Fellowship Programme in accordance with the principles described in this manual. Specific guidance for coordinators and supervisors on continuous quality assurance at training sites, site appraisals and site visits is available separately (Annexes 09A and 09B).

5.2.2 Role of the supervisor

Fellows are placed under the responsibility of a main supervisor who is experienced in field epidemiology and/or public health microbiology at one of the training sites. The main supervisor must guide and closely follow the fellow during his/her fellowship, acting as his/her mentor. An assigned co-supervisor will assist the main supervisor in scientific and practical day-to-day issues. In addition to the main and co-supervisors, a dedicated epidemiology supervisor should be identified for EUPHEM sites to support EUPHEM fellows with epidemiological competencies and strengthen the link between the two disciplines. For EPIET fellows, a microbiology supervisor may be assigned to help the fellow with microbiological content of her/his projects.

Additionally, other experts (project supervisors) may be responsible for engaging and guiding the fellow on specific projects.

Overall, a fellow should benefit from approximately four hours of supervision per week with training site supervisors (i.e., main and project supervisors), allowing for some variation, depending on fellows and supervisors, and the status of projects.

The main training site supervisor is responsible for:

- assessment of training needs
- facilitation of learning activities
- ensuring access to field assignments
- monitoring the work plan of the fellow to ensure that all field assignments are completed
- coordinating collaboration at the training site and liaising with all supervisors to identify suitable projects
- reviewing progress towards acquisition of core competencies
- supervision of projects or identification of project supervisors
- having the main responsibility and final say of the scientific outputs and project proposals of the fellow and should give guidance for all scientific production (e.g., protocols, data collection instruments, manuscripts, etc.)

Supervisors play a key role in discussing evidence-based interventions in response to public health events and ensure that early drafts of outputs are shared with the frontline coordinators in a spirit of peer review, continued learning and quality improvement. This enables the coordinator to monitor the progress and competency acquisition of the fellows. Supervisors further contribute to the programme by:

- participating in site visits to other training sites
- teaching during the introductory course and/or modules
- participating in TSF meetings (one representative per training site and path) and workshops
- participating in training courses for senior experts (e.g., ECDC Summer School)

The main training site supervisor should:

- be in a long-term contract position to ensure continuity
- have held their current position or equivalent for at least one year to be sufficiently familiar with the local setting of applied epidemiology and public health microbiology in their country
- have at least six years of professional experience in intervention/public health/field epidemiology (EPIET) and nine years in public health microbiology (EUPHEM)
- be a graduate of a health science, with experience in public health or a related topic
- have a good understanding of the Fellowship Training Programme and be aware of the requirements and guidance documents
- have a sufficiently senior position to manage a fellow, coordination of fellowship activities within the training site, and open opportunities for projects within the training site

- have at least four years (EPIET) or five years (EUPHEM) of experience in the training and supervision of post graduate professionals
- be willing to contribute to fellowship-related activities (i.e., participate in meetings, site visits, supervisor training courses, facilitate in modules, comment on fellowship-related documents)
- be able to speak and write English at minimum B2 level

5.2.3 Fellows

Fellows in training are considered to be competent professionals and as such, they are expected to:

- work as part of the team at the training site and meet the professional standards expected of other staff members
- manage their work plan and priorities
- comply with deadlines from the training site or the fellowship, including deadlines for submission of abstracts and manuscripts for review and clearance
- all deliverables from the field assignments are subject to the role of the fellow, rules and guidance on contributions, authorship, clearance and acknowledgements (Annex 03)
- share all early drafts concurrently with the training site supervisors and scientific coordinators
- respond to feedback, revise as necessary and share written outputs with coordinators until quality standards are met
- upload all final outputs (e.g., final reports, protocols, training material, submitted abstracts and manuscripts, etc.) to ECDC's online training platform to document their achievements in the form of an 'e-portfolio' (EAP fellows follow the requirements of their programmes)
- make themselves available for public health emergencies
- comply with scientific, administrative, and logistical requirements

All activities carried out by the fellows must comply with the administrative regulations and codes of conduct that apply to the training site. While not always explicitly stated, attitudes relating to professionalism, ethics, and teamwork are core competencies and values of the programme.

5.3 Site visits

Training site visits are organised by the scientific coordinators, who are usually accompanied by a supervisor from another training site. As referred in the Administrative Decision on 'Rules governing the EU-track of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM)' for Cohort 2023, an acknowledged training site has a) trained a fellow within the last three years or b) has been visited and approved in the last three years or c) has had a successful training site appraisal no later than December in the year of the Call. Under special circumstances, site visits may be undertaken with a different timing and/or format.

The site visits are intended to support fellows and supervisors through a detailed formal appraisal of the training site. The objectives of the site visits are to review training environment, including logistical and administrative aspects.

If a training site is hosting a fellow, a further purpose of the site visit is to optimise interaction between the fellow, the supervisor and the frontline coordinator. Additionally, it provides an opportunity to identify the training needs of supervisors and assess whether the fellows' choice of projects addresses the training objectives (Annexes 09A and 09B). These visits are scheduled aiming for that every fellow receives at least one site visit (virtual or face-to-face if relevant) during their fellowship. Site visits for EPIET and EUPHEM in the same country/institute will be conducted in the context of one combined visit, whenever possible. When feasible, site visits will be organised to coincide with the mid-term review of the fellows.

5.4 Fellowship Faculty Office (FFO)

The FFO in ECDC's Public Health Training (PHT) Section is responsible for the faculty and administrative aspects of the programme and fellowship organisation (excluding grant management). It provides support to the scientific coordination team. EPIET-associated programmes provide their own administrative and faculty support.

5.5 EPIET Alumni Network (EAN)

The EPIET (and EUPHEM) Alumni Network ([EAN](#)) offers scientific opinion on EPIET, EUPHEM and EAP training content and participates in the TSF and the selection of EU-track fellows. Furthermore, fellows benefit from EAN resources provided to all members (e.g., weekly jobs/courses bulletin, newsletter, workshops/mini-modules).

6 Prerequisites and selection

The ECDC Fellowship Programme (EU-track and MS-track) call for applications specifies the formal eligibility criteria and selection processes each year. The Administrative Decision on 'Rules governing the EU-track of the ECDC Fellowship Programme, field epidemiology path (EPIET) and public health microbiology path (EUPHEM)' for Cohort 2023 (available [here](#)), this manual and its annexes are an integral part of the ECDC Fellowship Programme's call for applications.

7 Monitoring progress

7.1 Acquisition of core competencies

ECDC Fellowship Programme/EPIET-associated programmes monitor the acquisition of core competencies via an initial assessment conducted before or during the Introductory Course and recommended at 12 months (mid-term review) and during the exit review, using tools based on ECDC's core competencies. Competencies are documented on the basis of experience and quantified on a scale of 1 (basic) to 5 (competent).

The fellow initiates the process through a self-assessment using the Competency Development Monitoring Tool (Annexes 10A and 10B); which is then shared and discussed with the training site supervisor. The fellow and the training site supervisor document the assessment on the basis of the fellow's experience and scientific production (e.g., theoretical exposure through academic degrees or projects and outputs included in the fellowship portfolio). The fellow and training site supervisor share the output with the frontline coordinator.

The frontline coordinators monitor and advise on the content and conduct of the local training activities and provide support and feedback, as previously defined in this document.

7.2 Competency development and monitoring of field assignments

The Programme monitors progress in the completion of the field assignments through an incremental progress report, IPR (outline available in Annex 11A and 11B), or equivalent tools (EAPs) structured in accordance with the field assignments and competencies to be developed during the two-year training course. The tool tracks progress in the activities, both in terms of competency development and field assignments.

7.2.1 Incremental progress report (IPR)

For monitoring and information purposes, the fellows are required to update an IPR on a monthly basis, uploading it on the ECDC digital platform and discussing it with their supervisor. This requirement might differ for the EAP fellows. The IPR helps to document and monitor the progress of individual fellows in achieving the training objectives, training supervisors and the frontline coordinators. They are also used for administrative purposes such as presenting the outputs of the programme, thereby justifying the continuation of funding.

The specific objectives of the reports are:

- to provide information to training site supervisors and frontline coordinators to monitor the progress of each fellow towards achieving the training objectives, and to define future objectives
- to provide documentation which may inform internal training site appraisals, and future external evaluation of the programme

7.3 Mid-term review

Fellowship programme/EPIET-associated programme coordinators conduct a mid-term review (virtual or face-to-face) with the fellow and his/her supervisor/s. The objective is to review:

- acquisition of core competencies
- progress in field assignments
- training needs for the second year of fellowship
- prioritisation of the training activities for the second year

Upon completion of the mid-term review, the coordinator and the supervisor evaluate how the fellow is doing with respect to the field assignments. Consensus during the review determines whether the fellow is

(1) ahead, (2) on track, (3) in need of follow-up or (4) at risk. Fellows requiring follow-up or at risk will be monitored and offered additional reviews (Annexes 12A and 12B).

7.4 Exit review and interview

Fellowship programme/EPIET-associated programme scientific coordinators and supervisors conduct an exit review of the fellow's achievements during the fellowship (Annex 14). During this review, it is assessed whether competencies have been acquired, and whether field assignments have been completed with deliverables that meet programme quality standards, and that all deliverables are uploaded to ECDC's digital platform.

In addition, an interview (Annex 14) is organised before the end of the fellowship to receive feedback from the fellow on the programme, learning objectives, possible challenges, and the interaction with scientific coordinators and training site supervisors. The fellows are asked to provide feedback on the modules and recommendations for improvement of the programme.

If training objectives are not achieved, the Head of Fellowship Programme/EPIET-associated programme Director may grant extensions for a fellow to complete outstanding graduation requirements: extensions which have budgetary implications are decided on a case-by-case basis by ECDC's authorising officer. A training site requiring an extension for the fellow to complete his/her fellowship must make a request for the extension in writing to the Head of Fellowship Programme/EPIET-associated programme Director, specifying justification and assignments to be completed and expected termination date.

7.5 Portfolio

At the end of the programme, fellows produce a 'fellowship portfolio' in the form of a report (Annexes 13A-EPIET and 13B-EUPHEM) that reflects the overall experience of the fellowship and documents achievements. This requirement might differ for EAP fellows. This fellowship portfolio focuses on deliverables and includes the contributions of the fellow in each of the achievements as well as a reflection by the fellow, main supervisor and coordinators on achievements and competencies acquired. Publications and communications are referenced in ICMJE (Vancouver) format. Upon completion of the fellowship, ECDC uploads all portfolios onto its website. **Publication of the portfolio does not automatically imply receipt of the diploma.**

The final portfolio is based on the individual projects conducted during the two-year fellowship. Portfolios serve as a documentation of the outputs and impact of the fellowship and are a tool for measuring the performance of the programme.

7.6 Requirements for completion of fellowship and diploma

Fellows who complete the full-time training period and comply with the graduation requirements receive a diploma.

The Head of Fellowship Programme, or by delegation to a scientific coordinator, is responsible for confirming with frontline coordinators and supervisors whether the fellow has achieved the requirements for completing the fellowship.

Before graduation, the portfolio presented by the fellow will be reviewed and evaluated by the scientific coordinators. Minimum requirements are:

- 1) Successful completion of all field assignments:
 - conducting a surveillance project, as described in the field assignments for surveillance (4.3.2)
 - participation in an outbreak investigation, as described in the field assignments for outbreak investigation (4.3.1)
 - planning, implementing and reporting on an applied public health research project, as described in the field assignments for applied public health research (4.3.3)
 - conducting projects or activities relevant to microbiological techniques or with laboratory-based surveillance or outbreak investigations or a project related to core competencies according to the matrix (EUPHEM)
- 2) Submission of a written manuscript in English, as output of one of the above field assignments for publication as first or last author in a peer-reviewed journal (4.3.5)

- 3) Scientific presentation of the results of one of the above field assignments at a scientific conference (oral or poster) (4.3.5)
- 4) Engagement in teaching and training activities, as described in the field assignments for teaching (4.3.4)
- 5) Participation in required training modules (except in justified and/or unforeseen circumstances)

If one or more training objectives are not met, the fellow will not receive the diploma, but receives a certificate of completion related to the activities conducted during the fellowship.

8 ECDC Virtual Academy (EVA) – the online training platform

The fellowship programme uses ECDC's Virtual Academy (EVA) as its learning management system. Each fellow is requested to set up his/her own profile. During the fellowship, fellows share relevant documents (e.g., protocols, reports, abstracts, presentations and manuscripts) via their respective personal folders. EAP fellows will follow their programme requirements. ECDC offers to host the IPRs prepared by the EPIET-associated programme fellows in EVA.

The uploaded outputs constitute an e-portfolio that documents whether the fellow meets the criteria necessary for graduation. Hence, the fellow's portfolio must contain all final versions of the field assignment outputs. Fellows also upload their IPR to EVA every month.

9 References

1. European Centre for Disease Prevention and Control. Core functions of microbiology reference laboratories for communicable diseases. Stockholm: ECDC; 2010. Available at: <https://www.ecdc.europa.eu/en/publications-data/core-functions-microbiology-reference-laboratories-communicable-diseases>
2. European Centre for Disease Prevention and Control. Fostering collaboration in public health microbiology in the European Union - A needs analysis. Stockholm: ECDC; 2010. Available at: <https://www.ecdc.europa.eu/en/publications-data/fostering-collaboration-public-health-microbiology-european-union>
3. Regulation (EC) No 853/2004 of the European Parliament and of the Council of 21 April 2004 establishing a European Centre for disease prevention and control. Available at: <http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004R0851:EN:HTML>
4. Biggs, JB, Tang C. Teaching for quality learning at university. Buckingham: Open University Press/Society for Research into Higher Education. (Fourth edition). Glasgow, UK: McGraw Hill; 2011.

ANNEXES (see separate documents)

Annex 01 Core competencies for EPIET fellows

Annex 02 Core competencies for EUPHEM fellows

Annex 03 Guidelines for scientific outputs

Annex 04A Project proposal form for EPIET fellows

Annex 04B Project proposal form for EUPHEM fellows

Annex 05 Guidelines for writing outbreak investigation reports

Annex 06A Guidelines for oral presentations

Annex 06B Guidelines for making poster presentations

Annex 07 Matrix portfolio for EUPHEM fellows

Annex 08 SOP International Assignments

Annex 09A EPIET guide for site appraisals and visits

Annex 09B EUPHEM guide for site appraisals and visits

Annex 10A Competencies Development Monitoring Tool for EPIET fellows

Annex 10B Competencies Development Monitoring Tool for EUPHEM fellows

Annex 11A Incremental Progress Report (IPR) for EPIET fellows

Annex 11B Incremental Progress Report (IPR) for EUPHEM fellows

Annex 12A Midterm review form for EPIET fellows

Annex 12B Midterm review form for EUPHEM fellows

Annex 13A Portfolio template for EPIET fellows

Annex 13B Portfolio template for EUPHEM fellows

Annex 14 Exit interview form and process