EUROPEAN PUBLIC HEALTH MICROBIOLOGY (EUPHEM) TRAINING PROGRAMME

Working Document
Scientific Guide
EUPHEM Fellows
2013

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1. BACKGROUND

1.1. What is Public Health Microbiology

ECDC National Microbiology Focal Points1 (NMFP) define 'Public Health Microbiology' (PHM) as a cross-cutting area that spans the fields of human, animal, food, water, and environmental microbiology, with a focus on human health and disease.[1] The primary work function is to use microbiology to improve the health of populations in collaboration with other public health disciplines, in particular with epidemiologists. European preparedness for responding to the infectious disease threats requires a sustainable infrastructure of public health microbiology laboratories that play a central role in detection, monitoring, and outbreak response, and that provide scientific evidence to prevent and control infectious diseases. A range of expertise is necessary to fulfil these requirements including epidemiology and public health microbiology. Public health microbiology is required to provide access to experts with expertise/experience in important communicable diseases at the regional, national and international level and to mount a rapid response to emerging health threats. Organisational laboratory network models and expert professionals serving these public health microbiology functions differ widely across EU Member States. Thus, there is an opportunity to define common objectives and foster exchange of best practices to enhance operational capabilities.[2]
According to articles five and nine of the founding regulation of the European Centre for Disease Prevention and Control (ECDC) (EC No 851/2004)[3], 'the Centre shall, encourage cooperation between expert and reference laboratories, foster the development of sufficient capacity within the community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health and as appropriate, support and coordinate training programmes in order to assist Member States and the Commission to have sufficient numbers of trained specialists, in particular in epidemiological surveillance and field investigations, and to have a capability to define health measures to control disease outbreaks'. Past experiences in outbreak investigations and surveillance suggest that the public health microbiology speciality is in short supply. As a consequence, ECDC has initiated a two-year European Union public health microbiology training programme (EUPHEM) closely linked to the European Programme for Intervention Epidemiology Training (EPIET). Both EUPHEM and EPIET are considered as 'specialist pathways' of the two-year ECDC fellowship programme for applied disease prevention and control. This scientific guide describes EUPHEM training core competencies, training objectives, training content, supervision and coordination of the training. It is a starting point for expert and public opinion necessary for future endorsement.

1.2. Purpose of this document

This scientific guide aims to give a detailed overview of the EUPHEM training objectives, training content, supervision and coordination of the training. You will find examples of a competency assessment form, incremental progress report, outbreak report and a guide to oral and poster presentations, matrix, and project description form, SOP for international assignment and other guides in the appendixes.

All forms in the Appendix section are to be seen as examples and are subject to change. Please always use the latest version sent out directly from the EPIET/EUPHEM coordinators.

1.3. Use and users

The list of core competencies is intended to be used as a reference document for training EUPHEM but can be used by any training programme related to PHM.

It will be updated periodically by EUPHEM forum and in collaboration with the potential users (NMFPs, training programmes, etc). The list is not exhaustive.

They should also be an important tool during the assessments done in the country visits, to identify areas of work or expertise that should be strengthened.

Important uses include:

- Evaluation of training needs: for recruitment and later, to assess the status in the learning process as achievements against competencies. Sub-competencies, considered as the ability to perform specific tasks, may be more suitable for this purpose;
- Curriculum development and instructional design;
- Accreditation of training programmes: competencies and curricula of training Programmes should be assessed as part of any accreditation process;
- Potential users are not only public health institutes and training programmes, but also individual professionals and trainees;

In order to cover the scope of EUPHEM, seven core competencies were agreed together with the EUPHEM forum and discussion with NMFPs.

2. PROGRAMME CONTENT AND LEARNING OBJECTIVES

2.1. Long-term mission of EUPHEM

The long-term mission of EUPHEM will be to:

- Strengthen communicable disease surveillance in the European Union through integrated public health microbiology-field epidemiology networks
- Sustain outbreak detection, investigation and response nationally and internationally;
- Develop a European Network of Public Health Microbiologists;
- Develop a response capacity for PHM together with other disciplines inside and beyond the European Union
- Foster future leaders in PHM in Europe;

2.2. Training content

The training primarily consists of **learning by doing and practicing through services**. Modules and courses are additional training opportunities. The fellows start with the three-week EPIET/EUPHEM introductory training course that takes place at the end of September each year. In total, each fellow is obligated to participate in ten module weeks, of which nine are compulsory and one is optional. Additional training courses are chosen depending on the skills assessment of the fellows. Sites should provide these courses or facilitate participation of the fellows to the courses when other training needs have been identified by the skills assessment. Fellows participate in some of the mandatory epidemiology (EPIET/EUPHEM) training modules. Modules more tailored to the laboratory background are also offered.

2.3. Main domains and activities of public health microbiology core competencies in EUPHEM training

A competency is a combination of knowledge, skills and attitude/abilities that are critical to perform a task effectively. The domain of a core competency is the set of all possible skill/s and abilities which allows the function of the competency. Sub-domains are set of activities within a particular domain which allows the function of the domain. Activities are performance which leads to skills or abilities

Core competencies listed in this document are defined for mid-career and above professionals. Fellows should be trained in all main domains and their respective sub-domains. However, not all listed activities will need to be covered. Fellows will be assessed on an individual basis regarding the acquired competencies compared to the initial competency assessment. As a baseline the term 'core' indicates that the competencies should be a minimum pre-requisite for all public health microbiologists, regardless of the administrative level (international, national, sub-national, local, etc) he/she occupies in the public health system. They should be common to all professionals in this field.

Mid-career is defined as at least three years of experience in the area of microbiology after post- graduate studies (Master or equivalent) or having a PhD in microbiology or equivalent (clinical microbiology specialisation).

An example of a professional profile after training would be that of a head of a laboratory within a public health microbiology institute (e.g. reference diagnostics,

surveillance, preparedness, response activities, etc.). Despite the risk of creating artificial categories, this approach was chosen in order to facilitate the process.

Core competencies in the public health microbiology training programme:

1. Public health microbiology management and communication
2. Applied microbiology and laboratory investigations
3. Epidemiological investigations (surveillance and outbreak investigation)
4. Biorisk management
5. Quality management
6. Applied public health microbiology research
7. Teaching and pedagogic

Fellows should be trained in all main domains and their respective sub-domains. However, not all listed activities will need to be covered. Fellows will be assessed on an individual basis regarding the acquired competencies compared to the initial skills assessment. The core competencies in this document are composed of crosscutting and discipline specific domains, sub-domains and activities, and are presented as three levels. The level of expectations (minimum requirements) for EUPHEM fellows are indicated in front of each learning objective using the following levels.
Aware: Individuals are able to identify the concept but have limited ability to perform the skill independently (basic).
Skilled: Individuals are able to apply the skills (intermediate).
Competent: Individuals are able to synthesise, critique or teach the skills (advanced).

2.4. Core objectives

During the two-year training programme, the fellows work to reach the following core learning objectives:

Public health microbiology management and communication (aware/skilled)

- Design, organise and manage a public health microbiology laboratory;
- Asses risks to respond to a potential health threat;
- apply the roles and responsibilities of local, national and international organisations involved in infectious disease control;
- Coordinate response through using communication mechanisms and other tools;
- Communicate effectively with persons from a multidisciplinary background, authorities, the public and the media in the form of publications, reports, interviews, and oral presentations;

Applied microbiology and laboratory investigations (competent)

- Apply concepts of virology, bacteriology, parasitology/mycology and immunology to the public health disciplines;
- Identify the use and limitation of diagnostic and typing methods and their interpretation in patient diagnosis, outbreak investigations, surveillance and epidemiological studies;
- Recognise the specific issues with the use of laboratory and epidemiological methods in investigations of rare and emerging diseases;
- Design and apply safe sampling strategies for disease surveillance and for outbreak detection and control, both in humans and animals;

Epidemiological investigations including surveillance and outbreak investigation (Skilled)

- Set up surveillance systems (syndromic or laboratory based systems),
- analyse surveillance data,

- Evaluate an existing surveillance system
- operate microbiological support on surveillance systems;
- apply combined microbiological and epidemiological knowledge in outbreaks, surveillance, or unusual events;
- participate in an outbreak investigation;

Applied public health microbiology research (competent)

- Conduct all stages of a research project, from planning to writing a scientific paper;

Quality management (Skilled/competent)

- describe quality assurance;
- assess and experience different standards;
- Apply the concepts of external quality assurance (EQA);
- Perform, evaluate or analyse results of an EQA;

Biorisk management (Skilled)

- Apply national, European and World Health Organization (WHO) rules and regulations regarding biosafety and biosecurity and understand how these may influence response to an outbreak;
- Use appropriate decontamination strategies/ personal protection and their applicability in field situations;
- Determine the need for quality management, biosecurity management, and crisis response as core elements of management of the of a public health microbiological laboratory;

Teaching (Skilled/competent)

- Identify training needs, planning and organising courses;
- To moderate case studies, give lectures and perform pedagogical teaching;

Modules:

Current EUPHEM compulsory modules:

- EPIET/EUPHEM introductory course (three weeks)
- outbreak investigation module (five days)
- Vaccinology (five days)
- Biorisk and quality control/quality management (five days)
- Initial PHM management and leadership/teamwork (five days)
- Project review (two x five days)

Current optional modules:

- Multivariable analysis (five days)
- Rapid assessment of complex emergency situations and mass gathering (five days)
- Communication and scientific writing (five days)

The list of compulsory and optional modules can be modified from time to time in order to adapt the training needs to the EUPHEM programme.

2.5. Public health microbiology management and communication

Public health management is defined as the capacity to identify and prevent/control threats to the health of the public caused by microorganisms or their products (e.g. toxins), and to construct policies and strategies that support improvement of the population's health.

Public health microbiology management in this context comprises different disciplines. These include all areas of microbiology (bacteriology, virology, and parasitology/mycology) within different disciplines (medical, veterinary, environmental, food), as well as epidemiology. Public health microbiology management includes public health, laboratory and communication management.

There are different levels of public health microbiology management. The EUPHEM management core competency is aimed at training the fellow at different and distinct management levels as outlined below:

Public health management

General

- Describe the added value of public health microbiology for public health;
- Apply principles of scientific communication to peers, stakeholders and media/public;
- Identify public health priorities in complex emergency situations ;
- Recognise security issues,
- Know the role of different agencies;
- Identify elements of stress management;

Knowledge of planning outbreak responses at national and international level

- Identify interdisciplinary needs between health-care professionals and front-line responders;
- Implement lessons learned from planned exercises;

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;

Rapid assessment techniques

- Use rapid assessment in the early phase;
- Use relevant indicators to monitor intervention;

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 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

Fellows as professionals are expected to integrate with the ethical rules related to their work. There are organisational ethics, as well as other ethical codes binding the person to the principle of collaboration, publication ethics, and personal integrity. Fellowsare expected to respect and adhere to ethical principles regarding human welfare when planning studies, conducting research, and collecting, disseminating and analysing data and apply relevant laws to data collection, management, dissemination and use of

information. They must adhere to ethical principles regarding data protection and confidentiality regarding any information obtained as part of their professional activity and handle conflicts of interests.

Laboratory management

This includes simple daily bench work to more advanced planning for management of teamwork, laboratory networking (both internally and externally), and project management.

Identify and apply best laboratory techniques

- Apply appropriate sampling strategies;
- Apply appropriate laboratory investigations and sampling preparation techniques;

Specimen transportation

- Review and report on the international regulations and the role of stakeholders;(i.e. International Air transport Association (IATA), International Civil Aviation Organization (ICaO), customs,) in movement of infectious materials across national borders;
- Outline field microbiology needs and design packaging and transportation protocols;

Rapid assessment techniques

- Identify_methods for detection of pathogen/cause of unusual events;
- design a protocol to gather the laboratory results;

Communication skills

Communication skills here include diverse levels of communications (national and international). Communication of public health microbiology information is a crucial task for appropriate public health action. During the two-year programme, EUPHEM fellows should:

- Submit abstracts to the European Scientific Conference on Applied Infectious Disease Epidemiology (ESCAIDE) conference;
- Prepare a scientific report/paper (one or more of the following):
  - Field investigation (outbreak) report;
  - Short article in a microbiology/epidemiological bulletin;
  - Scientific paper for a peer-reviewed journal (as first author);
  - Make an oral scientific presentation at an international conference;

Other optional activities include:

- Appraise a scientific article
- Communicate with the media
  - be involved in the preparation of a press release;
  - respond to journalists' interview requests (newspaper, radio or TV) if appropriate;
  - prepare a question and answer briefing (frequently asked questions) document.

2.6. 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.

General microbiology

Microbiology knowledge

- Outline and describe the role of the laboratory in surveillance, outbreak investigation, applied research;
- Understand the principles and practices of bioinformatics and phylogeny;
- Define the type of analysis depending on the study design;

Establish the criteria for microbiological input and evaluation;

Establish microbiological criteria and assessment;

- Design and conduct laboratory investigations in accordance with the documented 'risk assessments;'

Collect data

- Create a data entry scheme;
- Record using appropriate IT support;

Analyse the data

- Identify and use appropriate analytical and statistical techniques;

Laboratory investigation

Conduct an investigation

- Undertake a laboratory investigation in a public health setting including the following steps:
  - knowledge of principles:
  -
  - development of a microbiological case definition
  - sampling strategies
  - laboratory techniques
  - incident team coordination
  - environmental procedures
  - environmental contacts

Engage in interaction between different disciplines

- Identify needs and objectives of clinicians, laboratory, veterinary and environmental agencies in the public and private sector;
- Give advice in pre-sampling, sampling, analysis, reporting, documentation, feedback;

Specimen collection

- Define a sampling strategy including number of needed specimens;
- Collect, label, package and transport samples appropriately and safely;

Specimen transportation

- Review and report on the international regulations and the role of stakeholders; (i.e. IATA, IACO, customs,) in movement of infectious materials across national borders;
- Outline field microbiology needs and design packaging and transportation protocols;

Laboratory methods and analysis

Fellows are expected to learn different laboratory methods and analysis. The list below offers some examples but is not comprehensive.

Knowledge of phylogenetics

- understand principles of multiple alignment;
- Construct and interpret of a simple multiple alignment;
- Phylogenetic analyses techniques;
- Create and query a local basic local alignment search tool (BLAST) database;
- Evaluate the software and troubleshooting;

Sequencing technologies and non-sequencing typing methodology

- Prepara and run of automated sequencing systems;
- design and interpretVariable number tandem repeat (VNTR) assay;
- Run Pulse Field Gel Electrophoresis;
- Run serological methods;
- evaluatithe software and handle troubleshooting;
- Produce and interpret data;

Database systems

- Retrieve sequence manage simple sequence entry;
- Create a database using different software;
- Complex sequence entry: Trace data from automated sequencers;
- Edit sequences by using editing programs (e.g. Bioedit);
- Analyse sequences by using sequence databases;

Laboratory methods

- Identify key laboratory investigations relevant to selected symptoms and/or suspected pathogens;
- Identify situations where genetic typing methods should be used;
- Perform evaluation studies of diagnostic test accuracy (sensitivity, specificity, positive and negative predictive value);

Establish the criteria for microbiological input to epidemiological investigations

Collaboration between epidemiologists and laboratories are of immense importance in order to gather data necessary for understanding the epidemiology of communicable diseases. Fellows are expected to identify criteria for input of microbiological data and supply this data to epidemiological investigations.

2.7. Epidemiological investigations: surveillance and outbreak investigation

Surveillance systems and outbreak investigations within communicable disease are dependent on laboratory results as well as epidemiological investigations. Public health microbiologists need to **be able to set up and/or manage day to day surveillance systems activities, or evaluate** surveillance systems . Outbreak investigations represent one of the most exciting and also challenging activities. Time constraints, media attention, and the need for adequate methodology place the professional under pressure when the need for rapid action conflicts with the need for accurate and valid investigation and results.

Surveillance

Design and implement, analyse or evaluate a surveillance system

The pedagogical objective of this activity is to acquire competencies in the planning and implementation process of a new system or/and managing data analysis or evaluation of a disease surveillance system.

New system

- Design the surveillance system (public health importance, action/intervention available, objectives of the system, case definition, indicators, data collection, source of information, transmission of information, software and hardware, data analysis, feedback procedures, recipients, use of information);
- Develop a case report form and obtain clearance from appropriate individuals or offices;
- Obtain support for the surveillance system from the individuals who will be responsible for ensuring that the system is implemented;
- Conduct a pilot study if necessary;
- Supervise data collection and collation;
- Analyse the data, selecting appropriate methods;
- Provide the results of the analysis to appropriate individuals choosing the appropriate mode of communication;
- If the findings of the surveillance system indicate the need for prevention or control measures, or further investigation, make appropriate recommendations;
- Develop a framework to evaluate the surveillance system using standard criteria;

Day-to-day surveillance activities

- Check incoming surveillance reports for plausibility and collection of missing information;
- Conduct regular data analysis of surveillance data;
- Interpret current trends in the surveillance data and develop corresponding recommendations;
- Participate in regular feedback of surveillance data to stakeholders;
- Write a scientific report using the analysed data;
- If the findings of the surveillance system indicate the need for prevention or control measures, or further investigation, make appropriate recommendations for the improvement of the surveillance system (such as new questionnaires);

Evaluation of an existing surveillance system

Criteria to be used to assess the system:

- Describe the public health importance of the health event, and the public health strategy
- Describe the system:
  - list the objectives;
  - describe the health event;
  - state the case definition;
  - draw a flow chart of the system;
  - describe the components and operational modes of the system;
  - assess usefulness by indicating action taken as a result of the data from the surveillance system;
- Evaluate the system for each of the following criteria: simplicity, flexibility, acceptability, sensitivity, positive predictive value, representativeness, timeliness;
- Describe the resources used to operate the system;
- List conclusions and recommendations;

On the basis of the assessment, identify areas for improvement and their feasibility. Provide the supervisor and other appropriate individuals with written recommendations for improving or discontinuing the surveillance system. If requested by the supervisor, assist with implementing improvements to the existing surveillance system.

Outbreak investigations

The training objectives are to gain knowledge and skills of the administrative, managerial, operational and methodological aspects of outbreak investigations. The following classical approach (ten steps) to outbreak investigation can be used as a guide and a basis for evaluating the acquisition of skills in outbreak investigation for PH microbiologists:

- Obtain preliminary information:
- describe public health problem, how it was discovered;
- Gather epidemiological information ;
- Address nature of problem and urgency of it;
- plan for future action;
- establish what level of control or investigation is necessary;
  - major emphasis on control, minor emphasis on investigation
  - emphasis both on investigation and control
  - more emphasis on investigation than control
  - emphasis on investigation (research purposes);
- make a site visit if requested and agreed,;
- construct or take part in the establishment of the outbreak control team;
- conduct an on-site investigation;
- confirm the outbreak, diagnosis, case definition;
- count cases and orient the data according to time, place and person characteristics;
- develop a hypothesis compatible with descriptive data and with the suspected source and the vehicle;
- test hypothesis, verify biological plausibility and compatibility of epidemiological results with other information;
- develop recommendations for preventive and control measures, verify that control measures are effective;
- write a report and communicate results and recommendations. If appropriate, write a scientific article ((see structure and example in Appendix 4-8)).

2.8. Biorisk management

The scope of biorisk 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. Biorisk management results 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.

Biosafety

- Review international biosafety guidelines
  - - apply the principles and practices of biosafety according to those outlined by WHO & EU directives
- Personal protective equipment (PPE)
  - -describe variation and efficacy of PPE strategies.

- -- assess and experience different PPE systems
- -- apply the concepts of 'Operational protection factors' (OPF)

- Decontamination and waste control strategies
  - -- Understand the principles and practices regarding decontamination processes associated with infection control, equipment decontamination etc.
  - -- Plan and produce decontamination and waste disposal protocols

- Biosafety level3 (BSL) and BSL4 biorisk management
  - -- Understand processes associated with BSL3 and BSL4 laboratories
  - -- Plan and produce decontamination in BSL3 and / or BSL4 laboratories

Biosecurity

Understand the principles and practices of biosecurity according to those outlined by WHO & EU and national directives.

2.9. 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 health-care system and consequently for the health of the public. To ensure reliability, reproducibility and relevance of laboratory test results, quality management programmes are essential.

External quality assessment (EQA) and internal quality control (IQC) are complimentary components of a laboratory quality management programme. EQA is used to identify the degree of concurrence between one laboratory's results with established reference results or/and those obtained by other centres. IQC is used to find whether a series of techniques and procedures are performing consistently over a period of time. It is organised to ensure day-to-day laboratory consistency.

The EUPHEM programme will train the fellows to learn and apply standards in their daily work, participate in quality assurance activities, and if necessary, develop guidelines.

External quality assessment (EQA)

- describe efficacy of quality assurance;
- assess and experience different standards;
- apply the concepts of EQA;
- perform, evaluate or analyse results of an EQA;

Preparing an external quality assessment

- collect set of isolates/specimens for EQA;
- write protocols;
- identify related ISO standards;

Collecting Data

- design template for collecting data;
- integrate collected data;
- interpret integrated data;

Preparing a report

- create tables and figures;
- draft the EQA report;
- make conclusions and recommendations;

Review international quality guidelines / standards

- understand the principles and practices of quality assurance according to those outlined by international and EU directives;

Internal quality control

Contribute to audit

Within a laboratory setting, the quality of results is influenced by different factors. Fellows are expected to contribute when appropriate to the audit of laboratory procedures as outlined below:

- appropriate specimen collection and handling;
- selection of suitable techniques and maintenance of an up-to-date manual of standard operational procedures;
- use of reliable reagents and reference materials;
- selection of suitable automation and adequate maintenance;
- adequate records;
- reporting system for results;

Accreditation Procedure

- understand and apply local and European accreditation procedures;
- Contribute to audit of the accreditation

2.10. Applied public health microbiology research

Applied public health microbiology research is correlating basic science with clinical practice through addressing public health questions.

This should enable fellows to relate microbiology to public health. The pedagogical objective of this activity is to acquire the skills necessary to plan, conduct and analyse a public health microbiology study and to interpret and communicate its results.

The research project is chosen in collaboration with the training institute supervisor and should be part of the usual work carried out by the training institute. It should be necessary and useful for the training institute, and not merely an academic exercise.

It is recommended that fellows participate in all stages of the research project -- from planning to write a scientific paper -- as this offers the best opportunity to acquire public health research skills. Although this may not always be possible within two years, the fellow should attempt to contribute to as many stages as possible:

Study design

- identify a problem of public health importance;
- review literature;
- identify and a write study question and the hypothesis to be tested;
- design the study;

Study protocol / relevant questions

- identify critical questions;
- design protocols;
- exercise realistic timelines;

- identify limitations;
- Evaluat possible risks and delays;

Method identification

- identify relevant methods by literature review/discussion with supervisors and colleagues
  - choose appropriate methodology;
  - develop a plan of analysis;
  - write a detailed protocol;

Knowledge and skills of relevant methods

- Identify usefulness of the methods in a particular research study;
- Apply relevant laboratory methods;
- implement new methods in a study;

Seek financial support if necessary

- design and write an application;

Conduct a pilot study and, if necessary, make modifications

Constitute and brief the study team

- Inform the team on ethical procedures and requirements, obtain ethical approval;

Drafting results

- collect and analyse data;
- interpret the results;
- disseminate and communicate the information;
- write a scientific report and/or a scientific article;

All reports in the public domain are disseminated to the different training institutes and electronic copies stored in the ECDC Extranet. They are an important way of demonstrating the achievements of the programme. If the findings are judged to be of sufficient importance to the public health or the scientific community, a paper should be prepared for publication in a biomedical journal. They may also be used for training purposes (development of case studies). An example of an outbreak report can be found in Appendix 5.
All draft manuscripts have to be shared with the supervisors and coordinators at an early stage. **The EUPHEM affiliation can only be used if the manuscript has been shared, commented and cleared by the EUPHEM/EPIET coordinators. Manuscripts published without prior to sharing with the coordinating team will not count as an output to fulfil the communication objective.**
For details about different communication/publication see Appendix 11 and for criteria on contributor and authorship, see Appendix 6. More detailed suggestions to prepare an oral presentation or a poster are in Appendix 8.

2.11. Teaching and pedagogical skills

Teaching is one of the most effective ways to transfer knowledge and skills. By training the fellows to teach, they perform different activities that help them to improve their ability to communicate with a professional audience and learn current concepts of teaching and learning at a higher level. The focus will be on the role of the teacher and his/her professional development, learning as a cognitive process, different teaching

methods and their effect on learning, evaluation at different levels, and communication and pedagogical qualifications.

During the two-year programme, fellows should participate in the teaching of public health microbiology both in teaching institutions and in the field.

The pedagogical objective of this participation in training other individuals is to acquire the following skills and attitude/abilities:

Give lectures

- Give lectures (with discussion, etc.);
- Communication and training for a range of health-care professionals;
- Define learning objectives;
- Assess own performance through feedback assessments;
- Re-evaluate delivery and content;

Moderate case studies

- Moderate a case study;
- Guide participants to the answer;
- Explain epidemiological/microbiological/clinical concepts surrounding a disease or an outbreak;

Plan and organise a course

- Define course objectives;
- Outline learning outcomes, describe core competences;
- Develop curriculum;
- Identify teaching and assessment methodologies;
- Adopt training tools;
- Develop a reflective learning strategy;
- Create an assessment survey;

Pedagogical teaching

- Use interactive teaching and learning methods such as:
  - problem based learning (PBL), case studies, panel of experts, cooperative learning, , Brainstorming Philips 66, etc.;
  - manage adult groups;
  - design case studies;
  - prepare presentations;

Give and direct a seminar

- Deliver a seminar to multidisciplinary audience;
- Record reflective learning;

2.12. International assignment (Appendix 12)

Occasionally, institutes including WHO, ECDC, Ministries of Health (MOH) or Centres for Disease Control (CDCs) in different countries, Non-Governmental organisations (NGOs), private agencies/institutes request assistance and offer fellows opportunities for international assignments. EPIET/EUPHEM/EAP encourages this participation, as long as the assignments offer experience appropriate to the training objectives. According to those, all fellows should perform core activities (including outbreak investigations, surveillance projects, operational research projects and training of public health professionals) to acquire the necessary competencies and experience in field

epidemiology or public health microbiology during their fellowship.Usually, the assignments (displacements) last two-four weeks. However, the duration of the assignment may vary depending on the project. A SOP for international assignment has been developed and has been used in assigning fellows to the missions. For international missions identified and organised by host sites different procedure might apply. In General

- The cost of host site organised international projects will be covered by host site or NGO or other organisations requesting the assignment
- Chief coordinator will review the project proposal similar to all other projects and evaluate/see the EUPHEM and PH relevance
- Chief coordinator will review ToR for the mission in order to see security and insurance issues
- Check if there are any conflict of interest with ECDC values (commercialism, ets)
- Supervision of fellow during the assignment is responcibility of the chief coordinator of EUPHEM or deligated to another EPIET/EUPHEM frontline coordinator

2.13. Matrix portfolio of the training

Throughout the two-year fellowship, when possible projects will be selected that cover a range of technical aspects and infectious disease themes; they will be indicated in a matrix which will be used to build the portfolio. Each new project is described in a short (two page) proposal, stating background, objectives, learning objectives addressed, work plan, and proposed outcomes (Appendix 9). This proposal also states the specific supervision for each project. Protocols and draft reports should be shared with local supervisors, scientific programme co-ordinators and the ECDC training liaison person.

The matrix of two years training is planed both vertically and horizontally (table1). In horizontal part of the matrix seven core competencies (eighth domains) are located. In vertical part different disease group (DG)are allocated. At least four projects are expected to be performed by the fellow. Three are mandatory to be in outbreak investigation, surveillance and research. The forth one can be selected in any other competency domain (applied PH microbiology and laboratory investigation, biorisk management and quality management). These project should not be within the same DG but different. However a fellow might have outbreak investigation project as same as other projects due to unpredictability of the outbreaks. Public health microbiology management and teaching can also be covered in all are of the DG without blocking for additional projects in the same area. Beside the projects fellows will have activities which can be allocated in any DG. However it is recommended to avoid more than one activity within the same DG. This will contribute to a wide range of skills in different disease programmes. Each project and main activities should result in an output in form of a manuscript or a report. If fellow has previously worked in one disease specific group this group should not be chosen for the projects of the fellowship. However fellows are recommended to provide with their skills to the special needs when requested (e.g. outbreak investigation).

3. DIPLOMA

3.1. Requirements for completion of fellowship

Conditional to graduation, the portfolio presented by the fellows will be reviewed and evaluated by the scientific coordinators. Minimum requirements are:

1) Preforming 4 projects (3 compulsory and one optional) in subjects as below
   - Conducting surveillance project with responsibility for one or more specific tasks relevant for EUPHEM training as indicated in the portfolio matrix
   - participation in an outbreak investigation (ten steps), with responsibility for one or more specific tasks relevant for EUPHEM training and write an outbreak report
   - Plan, develop and conduct and report a laboratory based research study addressing a public health problem
   - Conduct Project or activities relevant to microbiological techniques or with laboratory based surveillance or outbreak investigations
2) Develop a course or workshop in collaboration with epidemiologist/s (lab for EPI or similar) and teach specific aspects of PHM to epidemiologists
3) Complete (submit) a written report/manuscript on one of the topics above for publication as first author
4) Present a project at a scientific meeting (oral or poster)

At least 10 h teaching and/or preparation of a teaching (for each lecture 3 h prepration) and/or preparation of a teaching material

1) Participation in 10 weeks of training modules according to this document (nine compolsory and one optional)

4. PROGRAMME ORGANISATION

4.1. General

EUPHEM and EPIET are both pathways of the same two- year EU fellowship programme coordinated and funded by ECDC. The ECDC scientific coordinator coordinates the governance of the programme with close involvement of the EUPHEM forum.

4.2. EUPHEM governance

A multidisciplinary approach governs EUPHEM:

EUPHEM scientific coordination

ECDC manages the scientific coordination of the programme.

The EUPHEM chief scientific coordinator based at ECDC manages scientific aspects of the programme, in collaboration with the EPIET chief coordinator. The role of the coordinators is to have regular contact with fellows and supervisors and together oversee, that fellows are attaining their objectives. The coordinators are also responsible for ensuring that core competencies and public health relevance of the projects are followed. The EUPHEM chief coordinator chairs the selection committee, identifies new potential training sites and organises initial site appraisals. He/she also organises regular site visits to existing EUPHEM training sites. The EUPHEM chief coordinator facilitates opportunities for EUPHEM fellows to partake in international assignments and monitors their progress during the assignment.

He/she organises or co-organises training modules for EUPHEM fellows. The EUPHEM coordinator will take a moderating role in case of conflicts between the fellow and the site supervisor. The chief coordinator and the supervisor sign the diploma of the fellows.

Training forum

The EUPHEM training forum includes representatives from the EUPHEM training sites. Chief coordinators of EUPHEM and EPIET, and the head of ECDC training section are counterpart and participate in the meetings of the forum. The training forum advises ECDC on operational, technical and pedagogical issues regarding the training programme. Any major changes to the programme will be consulated with the training forum, alongside with the national microbiology focal points and the ECDC chief microbiologist.

4.3. Supervision

Fellows are placed under the responsibility of a main supervisor who is experienced in public health microbiology in one of the EUPHEM training sites. The 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 issues. Besides the supervisor and the co-supervisor, scientists responsible for specific projects are available to guide the fellow on selected projects. When the main supervisor not having the proven experience m or not wish to provide supervision for epidemiology, a dedicated epidemiology supervisor is assigned to help and supervise the fellows with epidemiological core competencies.

Supervision process

The fellows will be assigned to a senior laboratory staff member of one of the hosting institutes who will be the main supervisor and primary contact. The main supervisor will monitor the progress according to the programme objectives, and be the contact person for ECDC, the programme office and the EUPHEM forum. A co-supervisor will follow the day-to-day work of the fellow in agreement with the main supervisor. Co supervisor is also responsible for communication with project supervisors if main supervisor is not available, alternate main supervisor at the forum, alternate main supervisor in case of absence or leave and help fellow with administrations issues when main supervisor is not available. Epidemiology supervisor will help the fellow with epidemiology core competency (outbreak investigation and surveillance), facilitate participation of the fellow in outbreak investigation, and review epidemiology output of the fellow, link EUPHEM fellow with EPIET fellow, link microbiology department with Epidemiology department.

The training site should ensure the fellow receives at least four hours per week of supervision. This time can be used for discussion and guidance through the fellows' projects.

- A competency assessment will be performed by the fellow at the start of the programme, to assess competences and training needs (see Appendix 1). Both main supervisor and coordinator assist the fellow in this assessment.
- Developing a curriculum and plans for projects will be discussed and evaluated together with the EUPHEM scientific coordinator on a regular basis.
- An initial competency assessment will be undertaken with the fellow when they start the programme. Weekly meetings will be held with the local supervisor to monitor progress, with a longer meeting on a quarterly basis coinciding with the quarterly report and presentations on the annual EUPHEM meeting (combined with ESCAIDE). The reciprocal mid-term and final evaluation will be conducted by ECDC and a training forum representative.

The training site supervisor is responsible for planning mentoring and following up of the progress of the fellow. This includes:

- performing a detailed initial competency assessment of the fellow, in order to identify projects and training activities that address the training needs before the introductory course
- repeating the competencyassessment at the end of the first year and before the end of the fellowship to assess the acquired comptencies and what training needs remain;
- agreeing with the fellow and the coordinators on the choice of the optional module;
- formulating a specific work plan to facilitate the choice of activities and subsequent training programme evaluation;
- regularly reviewing the fellow's progress towards the training objectives;
- reviewing the fellow's protocols and any type of oral or written communication;
- supervising the development of any project, investigation, evaluation or data analysis the fellow is conducting;

For day-to-day supervision the co-supervisor may assist the main supervisor in activities performed by the fellows.

The supervisor and the director of the training institute assume legal responsibility for the work carried out by the fellows. Thus all activities of the fellows must comply with

host country administrative regulations and codes of conduct. The supervisor needs to ensure that all the training objectives are addressed within the two-year period.

The supervisor must immediately notify the EUPHEM coordinator of any significant incidents occurring during the fellowship (in particular absences, sicknesses, accidents, unprofessional behavior, or interruption of the fellowship), which come to his/her attention, or of which the fellow has informed him/her.

4.4. Programme coordinators

The broad pedagogical activities of the EUPHEM training programme coordinators are:

- organising and developing of training programme content and methods, including training the trainers and seeking out-of-station assignments for fellows;
- monitoring progress, advising and counselling fellows;
- providing distance-tutoring for fellows;
- promoting and advocating the programme;
- maintaining contact with alumni;

In particular, these activities encompass the following areas:

- Define and develop EUPHEM training objectives
  - develop and update documents describing training objectives related to the core competency;
  - collaborate with each training site supervisor and fellow to ensure that individual training objectives are developed and reviewed regularly during the 23-month assignment;
- Promote EU-wide participation of national institutes in training collaboration:
  - systematically involve senior microbiologists from collaborating institutes in the various EUPHEM training sessions;
  - promote the development and hosting of EUPHEM training modules in collaborating institutes;
  - promote collaboration with other training organisations (e.g. field epidemiology training programmes, universities, public health schools);
  - facilitate links between EUPHEM and EPIET and other European public health programmes;
  - represent EUPHEM in relevant meetings and conferences;
  - update EUPHEM information on the website;
- Organise courses and training modules, and their subsequent evaluation:
  - plan, co-ordinate and evaluate the EPIET/EUPHEM introductory course;
  - help and support collaborating training institutes in planning and organising specific modules;
  - develop, implement and evaluate each module;
- Identify, assess and promote additional training opportunities and assignments:
  - identify suitable EU-wide investigations or research projects, and negotiate the participation of the fellows;
  - identify potential international assignments offering experience appropriate to the training objectives, and negotiate participation of the fellows;
  - establish and maintain contacts with other public health microbiology training worldwide in order to exchange training material, trainees and trainers;
- Monitor and promote EUPHEM training site developments
  - disseminate information about EUPHEM to all potential training sites;
  - identify potential training sites, and conduct initial site visits;

- regularly perform training site appraisals in each training institute;
- involve training site supervisors as facilitators in the various training modules;

- Develop training skills and techniques among actual and potential trainers at training sites, and among fellows
  - regularly organise and improve training the trainers modules;
  - use all EPIET/EUPHEM courses and modules as opportunities to strengthen the training skills of the fellows and training institute's supervisors;

- Provide pedagogical support/tutoring to the fellows
  - review initial skills assessment;
  - review specific training objectives as needed (midterm review and exit interview);
  - review protocols, reports, manuscripts, presentations as needed;
  - help identify and provide relevant literature when needed;
  - facilitate exchanges of information between EUPHEM and EPIET and EPIET Associated programmes EAP fellows;
  - respond or identify appropriate responses to queries from the fellows;
  - review fellows project during the project review module;

- Identify and develop training materials for coursework and for distant learning
  - identify and review material developed by groups involved in distance learning;
  - identify new relevant training material (case studies, video, computerised exercises) used in other training programmes;
  - encourage the development of new training material by training institutes;
  - promote and supervise the development of new training material by fellows;

4.5. Monitoring progress

EUPHEM fellows should share all their written production (protocols, reports and manuscripts) with their supervisors and with a copy to the EUPHEM and EPIET chief coordinators at an early stage. This will provide the opportunity to the supervisors and coordinators to assess their progress towards the objectives.
The EUPHEM /EPIET scientific coordinators monitor and advise on the content and conduct of the local training activities. Their tasks include:

- to regularly check if fellow's activities are addressing their learning objectives;
- to provide the fellows and trainers with additional methodological support, if needed;
- to offer support by reviewing protocols, reports and scientific articles or presentations made by fellows and to monitor their progress;

Incremental progress report

For monitoring and information purposes, all fellows are required to regularly update an incremental progress report (an incremental progress report (IPR, Appendix 2) and discuss it with their supervisor. The incremental progress report helps to document and monitor the progress of individual fellows in achieving the EUPHEM training objectives and to share this information with other fellows, training supervisors and the programme coordinators. They may also be used for administrative purposes such as justifying the release of funds for the EUPHEM programme.

The specific objectives of the reports are:

- to help training site supervisors and programme coordinators to monitor the progress of each fellow towards achieving the EUPHEM training objectives, and to define future objectives;

- to inform all EUPHEM training site supervisors of the training activities in other training sites;
- to provide documentation which may inform internal EUPHEM training site appraisals, and future external evaluation of the programme;

The report should reflect the results of regular meetings held between the fellow and the training site supervisor to review the fellow's progress against a detailed set of specific training objectives. The incremental progress report should be updated each time a new activity has been started, major progress in the training has been achieved or at least every months. The fellow should send the incremental progress report to all coordinators and his/her training site supervisor.

Midterm interview

The EUPHEM chief scientific coordinator conduct a mid-term review after the first year of the fellowship followed during a site visit with each fellow and his/her supervisors. The midterm review serves to summarise the achievements of the first year and identify existing training needs for the second year of training (Appedix 13 & 14)

Short site visits to each training site are currently organised by the programme coordinators every two years or more often, if needed. The site visits are intended to support fellows and trainers through a detailed formal appraisal of the local training site. The objectives of the site visits are to review:

- EUPHEM training environment, including logistical and administrative aspects;
- supervision of the fellow on-site and at the programme office level;
- training objectives and outcomes for the fellow;

Exit interview

The EUPHEM and EPIET coordinators conduct an exit interview with the fellows a few weeks before the end of the scheduled training period. During this interview, the coordinators assess whether all training objectives have been achieved and pass a review on the training of the last two years. The content of the exit interview is confidential (sensitive information about site or supervisor), to allow for open feedback about the programme. However coordinators might give some general feedback to the site in an appropriate way in order to facilitate improvements. (Appendix 15 & 16)

4.6. Regular EUPHEM forum teleconference

The regular EUPHEM forum teleconferences constitute a forum to discuss all issues related to the programme. All forum members book a day each month in their calendar for the teleconference. The teleconference is used for making decisions regarding fellows' progress, programme contents and also selection of candidates for interview.

4.7. ECDC Extranet

All EUPHEM as well as EPIET and EAP fellows, training site supervisors, coordinators, and the FPO have access to the ECDC Training Extranet (www.ecdc.europa.eu). The purpose of the Extranet is to provide the means to fellows, supervisors, coordinators and administration to share relevant documents and other information.

The Extranet platform has pages which are visible to all members, such as the Extranet Training Home. Each fellow has a folder with his/her name. During the two years of training, the fellow should upload all finalised and agreed documents (protocols, reports, presentations and manuscripts) in their respective personal folders. The

documents uploaded on the Extranet will serve as a base for the decision whether a fellow has achieved all training objectives.

In addition, fellows should upload their most recent IPR on the Extranet. The IPR is accessible to all fellows in training, training institute supervisors, and programme coordinators. If the written output of the fellow is of confidential nature, it should only be shared with the coordinators by email.

5. SELECTION

5.1. Selection of fellows

The training is aimed at EU citizens with a:

- post-secondary education (diploma) in microbiology or a related subject (medicine, veterinary, pharmacology, biomedicine etc.), with at least three years of experience of microbiology (any microbiology disciplines); or
- post-secondary education (diploma) and a PhD degree in microbiology or equivalent (clinical microbiology specialist);
- Advantage if previous experience in public health and epidemiology;

Fellows are selected from nationals of Member States of the European Union and the European Economic Area countries. They are selected based on the selection criteria regarding professional and personal characteristics/interpersonal skills. These are defined by ECDC with advice from the EUPHEM training forum and included in the call for application.

Candidates are selected through a call for applications advertised on the ECDC website. The director of ECDC appoints a EUPHEM selection panel that is chaired by the EUPHEM chief coordinators, and includes an EPIET coordinator, a representative of the current training sites (chair and co-chair of the forum). The EUPHEM chief coordinator is in charge of the selection procedure.

6. TRAINING SITES

6.1. Selection criteria for training sites

1. The proposed training sites should have a proven track record of a continuous professional development programme and be able to deliver training at a high quality level comparable with international recognised standards (Appendix 17).
2. The proposed training sites should have a documented track record of addressing the seven major EUPHEM activities during the 24 month training period:

   - possibility to train the fellow in management according to the description of the core competency;
   - conduct surveillance activities: laboratory surveillance, data analysis, development of new surveillance systems and evaluation of surveillance systems;
   - in close collaboration with epidemiologists conduct outbreak investigations from a microbiologist's perspective: diagnostic, molecular methods for outbreak investigation etc.;
   - plan, develop and conduct a laboratory based research study addressing a wide range of public health issues and perform/facilitate work in a Biosafety Level 3 laboratory;
   - conduct quality management and assurance according to EU/international regulations or equivalent;
   - communicate effectively (e.g. presentations, report writing, publications);
   - teaching possibilities;

   See also the learning objectives of the EUPHEM programme.

In the appraisal of new sites, ECDC will require a full overview of recent activities (annual/biannual report), publications (5 years) in the areas of interest as mentioned above and CV of competent supervisors.

3. The proposed training sites should have a structured supervisory team (main, co and epidemiology supervisors and project supervisors) and have the time and capacity for training the fellows for a minimum of four hours per week. A local supervision review should be structured to include a formal introduction of the fellows into the host institute, host country language training, participation in internal seminars/workshops, regular monitoring of the fellows' training plan and completion of assignments.
4. During their 24 months assignment, EUPHEM fellows are asked to be involved in at least four local study projects (including an outbreak investigation) which should fit with the seven major EUPHEM activities. The proposed projects for the fellows should be of high scientific quality and should have a multi-disciplinary approach relevant for public health. All projects undertaken by EUPHEM fellows are required to be part of the daily work carried out by the host institutes.
5. The proposed training sites should have the necessary microbiological infrastructure, facilities and equipment for laboratory training compliant with current European biosafety and biosecurity standards, adequate office space, information technology support, and library facilities.

6. Selection and evaluation of the training sites will be done by the EUPHEM coordinators and training forum against written and agreed standards. The following criterias apply.

Laboratories should:

- be public health laboratories or laboratories with a ddemonstrated public health focus d (motivation letter together with recent (five years) publications from the institute)
- be located in EU countries and have staff proficient in English
- have expertise in a range of topics covering most of the major infectious-disease related public health themes (sexually transmitted diseases, food- and water-borne diseases, vaccine-preventable diseases, respiratory diseases, emerging diseases and zoonoses, antimicrobial resistance, health-care associated infections)
- have established close links/ collaboration with epidemiology groups /training programmes
- have senior supervisor staff with experience in public health microbiology

- a. Requirement for application: potential training sites should provide a motivation for the application as a training site, that describes
  - the laboratory and its focus
  - possible project proposals
  - supervision structure and name of supervisor
- b. Selection procedure
  - review of letter of application by ECDC
  - site visit (before the start of the training) by ECDC representatives and preferably one representative from the training forum

Sites already approved for EUPHEM training are as below. However new sites can be established.

6.2. Current training sites for EUPHEM

1. Public Health England (PHE) - Microbiology Services Division, Colindale, London, UK
2. The National Institute of Public Health and the Environment (RiVM), Bilthoven, the Netherlands
3. Institute Pasteur (IP), Paris, France
4. Robert Koch Institut (RKI), Berlin, Germany,
5. Statens Serum Institut (SSI), Copenhagen, Denmark,
6. Instituto de Salud Carlos III (ISCIII), Majadahonda, Madrid, Spain
7. Groupement Hospitalier Est and for the Biology labs in the HCL, Lyon, France
8. Terveyden ja hyvinvoinnin laitos (THL), Helsinki, Finland
9. National Institute of Public Health (NIPH), Prague, Czech Republic
10. National Centre for Epidemiology (NCE), Budapest, Hungary
11. National School of Public Health (NSPH), Athens, Greece
12. Istituto Superiore di Sanità (ISS), Rome, Italy
13. Smittskyddsinstitutet (SMI), Stockholm, Sweden
14. National Inistitute of Public Health National and Institute of Research and Development for Microbiology and Immunology "Cantacuzino", Bucharest, Romania
15. National Inistitute of Public Health (FHI), Oslo, Norway

7. REFERENCES

1http://ecdc.europa.eu/en/publications/Publications/1006_TER_Core_functions_of_reference_labs.pdf

2http://ecdc.europa.eu/en/publications/Publications/1012_TER_Fostering_collaboration.pdf)

3Regulation (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. Available at: http://eurlex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32004R0851:EN:HTML

APPENDICES

Appendix 1: Competency Assessment

European PHMTraining Programme (EUPHEM)
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. This competency assesment 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).

Name: _____Host Site(s):__ :_____

Core domains				
1. Public Health Microbiology Management and Communication				
Tasks	Competency	**Previous experience**	**Scores (1-5)**	**Other verbs/Comments/ notes**
.1 Public Health Management				
General	Define PHM importance Understand principles and of scientific communication to peers, stakeholders and media/public Identify public health priorities in Complex emergency situations (CES) Be familiar with security issues Know the role of different agencies Identify elements of stress management			
Interpret and communicate the results	Interpret and evaluate significance of results in support of clinical management and infection control Prepare interpretation and communication strategies that informs the decision making process			
Write a scientific report/ or publish a scientific paper	Provide report in support of patient management, outbreak control and epidemiological support. Write a peer reviewed paper			
Identify a problem of public health importance	Keep updated with relevant issues Review literature Consult Medline			

Knowledge of planning outbreak responses at national and international level	Identify interdisciplinary needs between health care professionals and front line responders. Planning, implementation and lessons learnt from planned exercises.			
Infection control	Plan and implement infection control process within field study			
Response to severe epidemics	Identify key elements of social mobilisation Identify basic laboratory requirements in the field			
Rapid assessment techniques	Use rapid assessment in the early phase Use relevant indicators to monitor intervention Write situation reports			
1.2 Ethics and integrity issuse				
Familiarity with ethical roles	Understand and attach to organisational ethics Conduct ethical codes binding the person to her/his principle of collaboration Follow publication ethics Understand and keep personal integrity			
Ethical principles regarding human welfare	When planning studies and / or conducting research: • 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 the professional activity Handle conflicts of interests			
1.3 Laboratory management				
Identify best laboratory	Identify appropriate sampling strategies			

techniques	Identify appropriate laboratory investigation and sampling preparation techniques			
Samples transportation	Review and report on the international regulations and the role of stakeholders (i.e. IATA, IACO, Customs,) in movement of infectious materials across national boundaries Outline field microbiology needs and design packaging and transportation protocols			
Rapid assessment techniques	Identify methods for Detection of pathogen/cause of unusual events Design a protocol to grab the laboratory results			
1.4 Communication management				
Conferences	Write an abstract Attend relevant conferences Make an oral presentation Prepare a poster			
Appraise publication	Review manuscript (peer review) Present at journal club			
Peer-reviewed publication	Write a manuscript Build a scientific argument Produce a high level outline of the manuscript Write all sections of an article following the scientific writing structure Submit to peer reviewed journal Undergo editorial process Edit a manuscript after internal review Complete writing a manuscript			
Appraise publication	Review manuscript (peer review)			
Media communication	Prepare a press interview Prepare a radio interview			

2. Applied microbiology and laboratory investigations				
Tasks	competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
2.1 General microbiology				
Microbiology knowledge	Describe role of laboratory in surveillance, outbreak investigation, applied research Understand the principle and practices of bioinformatics and phylogeny Define type of analysis depending on the study design			
Obtain a peer review of the study protocol	Able to seek and take advice into account			
Establish the criteria for microbiological input and evaluation within study team.	Establish microbiological criteria and assessment Design & conduct laboratory investigations in accordance with the documented 'risk assessments'			
Collect data	Create a data entry scheme Record using appropriate IT support.			
Analyse the data	Identify and use appropriate suitable analytical & statistical techniques.			
2.2 Laboratory investigation				
Conduct an investigation	Undertake an laboratory investigation in a public health setting including: Knowledge the principles of: - 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	Identify needs and objectives of clinicians, laboratory, veterinary and environmental agencies, public and private sector; Think critical in pre-sampling, sampling, analysis, Reporting, documentation, feedback.			
Sample taking	Define a sampling strategy including number of needed samples; Collect , label, package and transport samples appropriately and safely.			
Samples transportation	Review and report on the international regulations and the role of stakeholders; (i.e. IATA, IACO, Customs,) in movement of infectious materials across national boundaries; Outline field microbiology needs and design packaging and transportation protocols.			
2.3 Laboratory methods and analysis				
Knowledge of phylogenetics	Identify and interpret microbiological results and phylogenetic studies required to support epidemiological tracing of infection source.			
Phylogenic analysis	Understand the principles of multiple alignment Construction and interpretation of a simple multiple alignment Phylogenetic analyses techniques Create and query a local BLAST database evaluation of the software and troubleshooting			
Non-sequencing typing methodology	Design and interpret serological, PulseField and VNTR data Etc			
Sequencing technologies	Preparation and running of			

	automated sequencing systems Critique of the software and troubleshooting Data production and interpretation			
Database systems	Sequence retrieval and simple sequence entry Create a database using BioNumeic and batch sequence import Complex sequence entry: Trace data from automated sequencers Edit sequences by using editing programs(e.g Bioedit) analysis Sequences by using sequence databases			
Engage in interaction between different disciplines (Lab/Epi…)	Identify needs and objectives of clinicians, laboratory, veterinary and environmental agencies Critical thinking in pre-sampling, sampling, analysis, Reporting, documentation, feedback			
Sample taking	Define a sampling strategy including number of needed samples Collect, label, package and transport samples appropriately and safely			
Laboratory methods	Identify key laboratory investigations relevant to selected symptoms and / or suspected pathogens Identify situations where genetic typing methods should be used Estimate sensitivity, specificity, positive and negative predictive value			
Samples transportation	Review and report on the international regulations and the role of stakeholders (i.e. IATA, IACO, Customs,) in movement of infectious			

	materials across national boundaries Outline field microbiology needs and design packaging and transportation protocols			

3. Surveillance and outbreak investigations

3.1 Surveillance

Tasks	competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
Plan method	State objectives of surveillance and action / intervention resulting from List indicators chosen Identify data needed			
Describe process	Describe type of surveillance Describe data sources Draw a flow chart Evaluate system attributes			
Analyse surveillance data	Perform a capture-recapture study Measure sensitivity of reporting			
Operate microbiological support on surveillance system	Actively participate in the operation of a surveillance system Perform routine analysis of surveillance data Write regular surveillance reports for stakeholders / those who need to know Implement improvements to the system			
Output	Assess feedback procedures Analyze use of information Write 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 and effect modification** **Standardization** **Measures of effect** **Measures of impact**	Choose free word			
Causality	Choose free word			
Computers **Statistical analysis package (SAS, STATA, SPSS)** **EPIINFO** **EPIDATA** **Word processing** **Graphic package** **GIS software** **Other multivariable analysis package** **Email, WEB**	Choose free word			
3.2 Outbreak investigation				
Respond to initial call	Evaluate and record relevant outbreak data set Review and understand on-call protocols Establish response requirements			
Prepare for investigation	Plan the investigation Identify investigation team requirements General knowledge of investigation design			
4. Quality Management				
Tasks	competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
Review international quality guidelines/standards	Understand the principles and practices of quality assurance according to those outlined by international & EU Directives			
External quality assurance (EQA)	Describe efficacy of quality assurance. Assess and experience			

	different standards Understand and apply the concepts of EQA			
Preparing EQA	Collect set of isolates/samples for EQA Write protocols Identify related ISO standards			
Collecting Data	Design template for collecting data Integrate collected data Interpret integrated data			
Preparing report	Crate tables and figures Draft the EQA report Make conclusion and recommendation			
Accreditation Audit	collect data on the origin and type of specimen and the dates and times when (i) the sample was taken (ii) the specimen was received in the laboratory (iii) the report was signed by the microbiologist; (iv) the report was sorted by the laboratory clerical staff (v) The final report was received on the ward Estimate the cumulative time from sampling to a result arriving on the ward			
Accreditation Procedure	Familiar with accreditation procedure Involved in accrediting procedure Responsible for accreditation			
5. Biorisk Management				
Tasks	competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
Review international biosafety guidelines	Understand and apply the principles and practices of biosafety according to those outlined by WHO & EU			

	Directives			
Personal Protective equipment	Describe variation and efficacy of PPE strategies. Assess and experience different PPE systems Understand and apply the concepts of 'Operational protection Factors'			
Decontamination & waste control strategies.	Understand the principles and practices associated with decontamination processes associated with infection control, equipment decontamination etc. Plan and produce decontamination and waste disposal protocols.			
Biosecurity	Understand the principles and practices of biosecurity according to those outlined by WHO & EU & national Directives			

6. Applied PHM Research				
Tasks	Skills/competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
Study design	Design a research study			
Study protocol/ relevant questions	Identify critical questions Design protocols Exercise realistic timelines Identify limitations Judge possible risks and delays			
Method identification	Identify relevant methods by literature review/discussion with supervisor-colleagues			
Knowledge of relevant methods	Get Familiar with laboratory methods Isolation (culture) (Agar plate/colonies, Liquid media) Identification after culture Perform, Implement, Execute biochemical (physiological)			

	tests – Genetic tests (genomics) – PCR Sequencing – Restriction digestion – DNA-DNA homology (probes) Immunological test – Antigen detection – ELISA – Hybridization assay – Fatty acid profiling – Protein profiling (proteomics) Advance molecular methods – Microarray – RT-PCR – MOLDI Specific diagnostics – Gram staining – Cell culturing – Antibiotic susceptibility Fingerprint-based methods: – RFLP – PFGE, – AFLP Character-based methods – MLVA Multiple Loci VNTR(Variable Number of Tandem Repeats) Analysis(), – ribotyping, – microarray's Sequence-based methods: – MLST – SNP analysis Bioinformatics-whole genome sequencing analysis etc			
Implementation of new methods	Implement new methods in a study Identify usefulness of the			

	methods in particular research study			
Trouble shooting	Able to solve technical and practical problems			
Drafting results	Scientific design of the draft Make tables and figures Interpret results Present results in a scientific way Discuss the results Draw conclusions Make recommendations			

7. Teaching				
Tasks	Skills/competency	**Previous experience**	**Verbs from the list**	**Comments/notes**
Identify training needs	Carry out needs assessment and identify specific initiatives			
Give lectures	Communicate and training for a range of healthcare professionals Define learning objectives Assess own performance through feedback assessments Re-evaluate delivery and content			
Moderate case studies	Moderate a case study Guide participants to the answer Explain epidemiological/microbiological/clinical concepts surrounding the disease or outbreak			
Plan and organise a course	Plan training activities as: Define course objectives Outline learning outcomes Describe core competences Develop curriculum Identify teaching and assessment methodologies Adopt training tools Develop a reflective learning strategy Create an assessment survey			
Pedagogical teaching	Give lectures (with discussion, etc.) Perform interactive teaching			

	and learning methods as: Problem Based Learning (PBL), Case Studies, Panel of Experts, Cooperative Learning, Project Based Learning, Brainstorming, Philips 66, etc. Manage adults groups Design case study Prepare presentations			
Give and direct a seminar	Deliver seminar to multidisciplinary audience Record reflective learning			

List of actions

	A	B	C	D	E	F
1	count	associate	Add	analyze	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	Formúlate
10	Outlines	Extrapólate	Divide	Discrimínate	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	

Appendix 2: Incremental Progress Report and Final Report

Incremental Progress Report – EUPHEM cohort4

From: Name

Cohort: Cohort number **Training site supervisor:** Name of supervisor

Update from: Current Date

Note: please indicate changes from last IPR in red

1) Administrative Matters:

Date:	Topic:	Status:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	List and comment on administrative issues relevant to the training programme (salaries, insurance, hosting office, communication means, reimbursements etc.).	Put status (starting, ongoing, completed…)	

2) Outbreak Investigations:

Date:	Type of outbreak and your involvement:	Status:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	Describe any involvement in outbreak investigations. Each completed outbreak investigation should be detailed in a summary <15 lines (context, investigation team, objectives, methods, results, conclusion, recommendations and actions). Please state also your role and if you were main investigator. Main investigator: Yes/No	Put status (starting, ongoing, completed…)	

3) Surveillance Activities:

Date:	Type of surveillance and your involvement:	Status:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	Summarise activities related to epidemiological surveillance, including protocols, data analysis and reports developed to set up surveillance systems, evaluation schemes and results of surveillance data analyses. Please state also your role.	Put status (starting, ongoing, completed…)	

4) Research Activities:

Date:	Type of research and your involvement:	Status:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	Summarise research protocols, study reports or manuscripts written during the last three months. The summary should include: objectives, methods, results, recommendations and public health impact. Please state also your role.	Put status (starting, ongoing, completed…)	

5) Biosafety/biosecurity activities

Date:	Type of activity and your involvement:	Remarks:	Please describe procedure, difficulties, timelines and reason for not compleeting

Put date	List the context and content of various activities which you helped to plan, develop or undertook. State the objectives, content, audience and location of the activity.	Put status (starting, ongoing, completed…)	

6) Quality management

Date:	Type of activity and your involvement:	Remarks:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	List the context and content of various activities which you helped to plan, develop or undertook. State the objectives, content, audience and location of the activity.	Put status (starting, ongoing, completed…)	

7) Training activities:

Date:	Type of training followed:	Status:	Please describe procedure, difficulties, timelines and reason for not compleeting	
Put date	a) List all training sessions which you attended during the reporting period, and include comments on their content. This information should also help to publicise training site or host country training opportunities.	Put status (starting, ongoing, completed…)		
	b) List the optional EPIET modules you have attended. Compulsory modules do not need to be mentioned.			
	c) Include the visits to the laboratories. Specify the length and the type of activities you			

	were involved with.			

8) Teaching Activities:

Date:	Type of teaching and your involvement:	Remarks:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	List the context and content of various teaching sessions which you helped to plan, develop or undertook. State the objectives, content, audience and location of the courses.	Put status (starting, ongoing, completed…)	

9) Management and Communication:

Date:	Type of communication (including publications and presentations):	Remarks:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	a) List all on call/ telephone help-line duties, TV and radio interviews, question and answers briefs, preparation of press releases, public health decision and policymaking sessions, oral scientific presentation, and poster presentations. List all scientific reports and manuscripts in preparation.	Put status (starting, ongoing, completed…)	
	b) List all publications, referenced using **Vancouver style** and organised according to type of article and type of journal: • Epidemiological bulletin • National or regional journals (state whether peer-reviewed) • International journals		

10) Other:

Date:	Type of activity and your involvement:	Remarks:	Please describe procedure, difficulties, timelines and reason for not compleeting
Put date	Short description of any other activity and your involvement	Put status (starting, ongoing, completed…)	

Appendix 3: Example of progress report (please notice difference in current version format)

Incremental Progress Report – EUPHEM Cohort 1

From: Satu Kurkela, EUPHEM Fellow C1

To: EUPHEM cohorts 1 and 2 and EPIET and FETP fellows cohorts 14-15, programme co-ordinators and supervisors

Cohort: 1

Update from: 18.8.2010

1) Administrative Matters:

Date:	Topic:	Status:
2.11.2008	Found a flat and moved in. Opened local bank account.	Completed
05.11.2008	Submitted the following documents to ECDC: Financial Identification, Daily allowance request, Travel imbursement request	Completed
25.3.2009	Installation allowance received.	Completed
11.8.2010	David Brown has sent an outline of the specific activities of my EUPHEM fellowship to the responsible body of the medical microbiology specialist training at the Faculty of Medicine in Helsinki. They will review activities that could be counted in benefit of the Finnish specialist training scheme.	Completed

2) Outbreak Investigations:

Date:	Type of outbreak and your involvement:	Status:
28.4.-5.5.09	<u>General pandemic (H1N1) 2009 activities</u> Worked as a **liaison between laboratory and epidemiologists at the Emergency Operations Centre of CfI**. • Adviced epidemiologists and local health protection units on e.g. sampling, specimen materials, storage and transportation of specimens, timing of sampling, turnaround time, logistics, subtyping, antibody kinetics, and effect of previous immunity to the tests, testing of recovered cases • Helped in composing information for the public concerning laboratory tests. Picked video footage filmed in the lab for national television channels.	Completed

	• Adviced on laboratory safety issues and containment level. • Adviced attending physicians of confirmed cases on required futher specimens • Participated in writing Q&A for regional laboratories	
6.5.2009	Wrote an **overview of currently available Influenza A/H1N1 Virus Biosafety Guidelines for Laboratories**. This functioned as a background material for the discussions between the CfI and the Health and Safety Executive (HSE) on laboratory safety issues regarding H1N1.	Completed
7.5.2009	Wrote an **overview of currently available data on clinical manifestations and complications** associated with Influenza A/H1N1 virus.	Completed
May-July 2009	**Pandemic (H1N1) 2009 Outbreak investigation in a school in London**: observational descriptive study (with Laurence) • Data collection • Data cleaning • Data analysis • Preliminary epidemiological report • Final report • Journal article manuscript	Completed Completed Completed 12.5.2009 Completed Completed Published 1/2010
15.10.2009	**Preparation of generic protocol for possible future H1N1 school outbreaks in the UK, including serosurveys.**	Completed

3) Surveillance Activities:

Date:	Type of surveillance and your involvement:	Status:
1/2009-5/2010	Creating a microbiological syndrome-based surveillance system for the **detection and investigation of undiagnosed serious infectious illnesses (USII)** • Major microbiological challenges identified • Presented the first draft of the protocol to the working group on 2 April 2009 and further actions were decided. • Checklist for firstline investigations created for all five syndromes.	Completed from my part (project ongoing)

1-8/2010	**HAV seroepidemiology in Europe (ESEN2 project)** The epidemiology of Hepatitis A virus (HAV) is known to vary geographically. Only scattered data are available on HAV seroepidemiology in Europe, and uncertainties exist about the age-specific susceptibility and average age of infection. Aim: to identify susceptible age groups and level of endemicity to inform HAV vaccination policy in the participating countries: Belgium, Czech Republic, England, Finland, Germany, Italy, Lithuania, Malta, Romania, and Slovakia. Each country tested sera (n=1854–6748), collected in 1996–2004 as residual sera remaining from routine laboratory testing (7/10 countries), or by population-based random sampling (3/10), for total HAV antibodies. The local laboratory results were standardised to common units. Information on disease epidemiology and vaccine policy was collected. • Data cleaning and analysis • Manuscript and abstract • Awaiting comments on the manuscript from country representatives (co-authors)	Completed 3/2010 Under preparation On-going

4) Research Activities:

Date:	Type of research and your involvement:	Status:

3/2009-10/2009	**Investigation on the public health significance of newly identified *picornaviruses* in humans.** Approaches: ***Conduct zoonotic and public health risk assessments of Saffold and Ljungan viruses; Develop and evaluated molecular and/or serological tools to investigate infection with these agents in human samples; Design study to assess prevalence of infections and any disease association.*** • ***Major challenges are now gaining access to the virus strains used in the tests and the serum sample archives. Ljungan virus infectious clone has arrived to the lab, Ljungan virus culture supernatant will arrive within a week. Saffold: ? May take several months to gain access to the serum sample archives.*** • ***Crude sample size calculations are being done*** • ***Wrote COSHH risk assessment for handling these pathogens in laboratory*** • ***The methodology has been developed with the help of related Mengovirus.***	Project frozen
3.4.2009	**Mumps seroprevalence and correlates of protection study, mumps outbreak Moldova, 2007- 2008**.	Cancelled
15.1.2010	**Reconstructing transmission trees from partially observed epidemic trees in a pandemic (H1N1) 2009 school outbreak.** Data from the abovementioned H1N1 school outbreak are being used for modelling of transmission events in a school setting. This analysis allows e.g. estimation or reproductive numbers by time from onset of symptoms. My role with Laurence is to assist the modellers to understand and interpret our data. Analysis is finished and manuscript is under preparation.	Manuscript under preparation

8/2009-5/2010	**Public health significance of Hantaviruses in the UK.** The hosts of hantaviruses Puumala (Myodes glareolus), Dobrava (Apodemus flavivollis) and Seoul (Rattus) are present in UK and these viruses, particularly Puumala virus, are widely found in their hosts in mainland Europe. In the UK, uncertainties exist about the presence of hantaviruses. Aim: to identify hantavirus infections in clinically suspected patients to contribute to assessing the public health significance of hantaviruses in the UK.
	• Preparatory work
	  • sample shipment
	  • pre-planning the lab work in Helsinki
	• Testing of specimens
	  • Screening of convalescent sera for *Avricolinae*-borne hantavirus antibodies with Puumala IgG immunofluorescence assay (IFA), and for *Murinae*-borne hantavirus antibodies with Dobrava-Saaremaa IgG IFA.
	  • In case of (specific or unspecific) reactivity in IgG testing, the convalescent samples underwent Puumala IgM (bac-PUU-N) ELISA, and both samples Puumala and Dobrava-Saaremaa IgM IFA.
	  • Short report
	  • Abstract
		Completed 3/2010
		
		Completed 4/2010
		
		Completed 5/2010
		Submitted

5) Training activities:

Date:	Type of training followed:	Status:
28.9.-18.10.2008	EPIET introductory course, **Menorca**	Completed
4.11.2008	Lecture: Pandemic Influenza Preparedness, **CfI**	Completed
11.11.2008	Journal Club, **CfI** (1h)	Completed
19.-21.11.2008	ESCAIDE conference, **Berlin**	Completed
1.-5.12.2008	EPIET CTOI module, **Cyprus**	Completed
27.-28.11.2008	Pointers conference (on blood borne infections in health care workers), **London**	Completed
17.12.2008	Rabies training, **CfI**	Completed
13.-16.1.2009	Train the trainer level course on Containment Level 3 Laboratory, Porton Down, **Salisbury**	Completed
1.-6.3.2009	Wellcome Trust Advanced Course: Virus discovery in Clinical Setting, **Cambridge**	Completed

10.3.2009	Journal Club, **CfI** (1h)	Completed
24.3.2009	Video Training session on working in CL3 laboratory, **CfI**	Completed
26.3.2009	Induction training session for Containment Level 3 Laboratory, **CfI**	Completed
20.-24.4.2009	EPIET Vaccinology module, **Helsinki**	Completed
14.-16.5.2009	ENIVD-CLRN annual meeting, **Prague**	Completed
14.6.2009	Basic Security in the Field, UN training and certificate	Completed
14.6.2009	Advanced Security in the Field, UN training and certificate	Completed
22.-26.6.2009	EPIET Rapid Assesment module, **Bristol**	Completed
25.8.2009	Journal Club, **CfI** (1h)	Completed
31.8.-4.9.2009	EUPHEM project review module, **Rome**	Completed
14.-16.9.2009	Health Protection 2009 conference, University of Warwick, **Coventry, UK**	Completed
6.-9.10.2009	ECDC PRU Briefing, **Stockholm**	Completed
16.10.2009	HPA Encephalitis Study Grand Finale, BMA House, **London**	Completed
26.-28.10.2009	ESCAIDE conference, **Stockholm**	Completed
25-26.2.2010	UK mini project review, **CfI, London**	Completed
9.3.2010	Journal Club, **CfI** (1h)	Completed
29.3.-9.4.2010	Laboratory quality assurance and tools for survey and control of tropical diseases (module of Masters of International Health 2009-2010 Erasmus Mundus: tropical diseases), **Bordeaux, France**	Completed
10.-12.6.2010	ENIVD-CLRN annual meeting, **Stockholm**	Completed
27.7.2010	European Workshop on Laboratory Diagnosis of Diphtheria (Lectures), **CfI, London**	Completed

7-8/2010	**A 5-week introduction round in the different units of the bacteriology department of the HPA/Centre for Infections**, including: • Antibiotic Resistance Monitoring & Reference Laboratory • Department for Bioanalysis and Horizon Technologies • Haemophilus reference unit • Streptococcus and Diphtheria Reference	Completed

	Unit • Laboratory of Health Care Associated Infection	
30.8.-3.9.2010	EUPHEM-EPIET project review module, **Rome**	Upcoming
14.-15.9.2010	Health Protection 2010 conference, University of Warwick, **Coventry, UK**	Upcoming
11.-13.11.2010	ESCAIDE conference, **Lisbon**	Upcoming

6) Teaching Activities:

Date:	Type of teaching and your involvement:	Remarks:
23.-27.2.2009	Gave a **lecture and facilitated in case study sessions** in the "Laboratory Essentials for Field Epidemiologists" EPIET module, Bilthoven, Netherlands • Lecture: Virus diagnostic methods • Case study: Atypical pneumonia in a city in the Netherlands (Legionella)	Completed
15.3.2010	**Group facilitation**, "Vaccinology", London School of Hygiene and Tropical Medicine	Completed

Preparation: 4-9/2010
Module: 8.-10.9.2010
	UK Lab4epi module for local EPIET fellows and SpR:s. The aim is also to create a frame for future Lab4epi modules as to programme and training material.
	Organisation of the module together with Sabine Dittrich and Marie-Amelie Degail.
	• Preparation of the module programme (with MAD and SD)
	  • Objectives
	  • Lecture topics
	  • Case study topic
	  • Order and timing of sessions
	  • Facilitators/lecturers
	  • Evaluation
	• Modification of an existing case study and preparation of supporting material to fit the purpose of the module (with SD). Facilitation of the case study during the module.
	• Lecture: *Factors influencing a laboratory test result* (by myself)
	• Lecture: *What is a public health laboratory?* (with SD)
	• Lecture: *Using diagnostic tests for public health decision making* (with SD)
	• Interactive session to familiarise
		Preparation ongoing

	participants on commont *lab terminology* (with SD)	

7) Communication:

Date:	Type of communication (including publications and presentations):	Remarks:
15.5.2009	**Presentation**: "EUPHEM training activities at HPA, London" **ENIVD-CLRN annual meeting, Prague**	Presented
9.7.2009	Draft proposal on assessing the public health significance of **arthropod-borne and rodent-borne viruses in the UK**, including a risk assessment. To be presented for the Department of Health.	Presented
28.7.2009	**Presentation**: "Pandemic (H1N1) 2009 virus outbreak in a school in London, April-May 2009:observational study" **EPIET Seminar on H1N1 Investigations, ECDC, Stockholm**	Presented
15.9.2009	**Conference abstract**: L Calatayud, S Kurkela, P Neave, A Brock , S Perkins, M Zuckerman, M Catchpole, R Pebody, R Heathcock, H Maguire. New Influenza A(H1N1) Virus Outbreak in a School, South-East London, April-May 2009. **Health Protection 2009, Coventry, UK**	Presented (poster)
27.10.2009	**Conference abstract**: L Calatayud, S Kurkela, P Neave, A Brock , S Perkins, M Zuckerman, M Catchpole, R Pebody, R Heathcock, H Maguire. New Influenza A(H1N1) Virus Outbreak in a School, South-East London, April-May 2009. **ESCAIDE, Stockholm, Sweden**	Presented (oral by LC)
1.9.2009	**Review article**: Kurkela S, Brown DWG. Molecular diagnostic techniques. **Medicine 2009;37:535-40.**	Published
7.10.2009	**Presentation:** "Pandemic (H1N1) 2009 virus outbreak in a school in London, April-May 2009". **ECDC PRU briefing week, ECDC, Stockholm**	Presented
5.1.2010	**Journal article**: Calatayud L, Kurkela S, Neave PE, Brock A, Perkins S, Zuckerman M, Sudhanva M, Bermingham A, Ellis J, Pebody R, Catchpole M, Heathcock R, Maguire H. Pandemic (H1N1) 2009 virus outbreak in a school in London: observational study. **Epidemiol Infect 2010;138:183-91.**	Published

25.3.2010	**Presentation:** "First experiences from the EUPHEM programme" **The 6th National Focal Point Meeting, ECDC, Stockholm, Sweden**	Presented
7.5.2010	**Factsheet:** Preparation of **ECDC Factsheet on Sindbis virus infection** with ECDC PRU.	Completed
13.5.2010	**Presentation:** Comparative Hepatitis A Seroepidemiology in 10 European Countries. **SpR Meeting, CfI.**	Presented
26.5.2010	**Book chapter:** Kurkela S, Brown DWG. Foot-and-mouth Disease, Vesicular Stomatitis, Newcastle Disease, and Swine Vesicular Disease. In: **Zoonoses - biology, clinical practice and public health control, 2nd Edition**, (SR Palmer, Lord Soulsby, David Brown, and Paul Torgerson, Editors). Oxford University Press. Oxford. U.K. Under preparation.	Pre-final draft submitted
11.6.2010	**Presentation:** EUPHEM training activities 2008-2010. **ENIVD-CLRN annual meeting, Stockholm**	Presented
18.8.2010	**Journal article manuscript:** Kurkela S, Pebody R, Kafatos G, Nardone A, Andrews N, Pistol A, Davidkin I, Vranckx R, Nemecek V, Hesketh LM, Thierfelder W, Bruzzone B, Griskevicius A, Barbara C, Sobotova Z, Miller E, Hatzakis A, Anastassopoulou CG. Comparative Hepatitis A Seroepidemiology in 10 European Countries.	Under preparation
14.9.2010	**Conference abstract/Presentation:** Comparative Hepatitis A Seroepidemiology in 10 European Countries. **Health Protection 2010 conference, Coventry, UK**	Upcoming; abstract accepted for oral presentation
Nov 2010	**Conference abstract/Presentation:** Kurkela S, Pebody R, Kafatos G, Nardone A, Andrews N, Pistol A, Davidkin I, Vranckx R, Nemecek V, Hesketh LM, Thierfelder W, Bruzzone B, Griskevicius A, Barabara C, Sobotova Z, Miller E, Hatzakis A, Anastassopoulou CG. Comparative Hepatitis A Seroepidemiology in 10 European Countries.	Upcoming; abstract accepted for oral presentation
Nov 2010	**Conference abstract:** Kurkela S, Brown D, Vapalahti O, Sivaprakasam V, Zochowski W, Smith R. No evidence of hantavirus infections in a series of 90 clinically suspected patients in the UK.	Upcoming; abstract accepted for poster presentation

8) Other:

Date:	Type of activity and your involvement:	Remarks:

12.11.2008	Wrote a report on the potential human pathogenicity of **Ljungan virus**	Completed
13.12.2008	Attended teleconferences regarding a fatal **anthrax** case in London.	Completed
28.2.2009	Wrote a **short introduction to EUPHEM** programme to EAN newsletter together with Sabine Dittrich	Completed
2.4.2009	Wrote a compulsory **COSHH risk assessment** for handling Saffold and Ljungan viruses in laboratory.	Completed
1.4.2009	Prepared a **presentation "Impact and effectiveness of Hib vaccine in the UK"** for the vaccinology module together with Jaran, Otilia and Laurence	Completed
4.11.2009	Identified and translated Finnish **guidelines on diagnosis and treatment of Lyme borreliosis** for a working group (lead by Dr Susan O'Connell at the Lyme Borreliosis Unit in Southampton). The working group is collecting a complete set of European guidelines.	Completed
24.-25.3.2010	Participated in **the 6th National Focal Point Meeting at ECDC** • Presentation (see above) and panel discussion (EUPHEM issues) • Working group moderation (EUPHEM issues) • Observation of the meeting (non-EUPHEM issues)	Completed

Appendix 4: Guidelines for writing outbreak investigation reports

Date: Date of report
To: Supervisor
From: Investigator(s)
Subject:
Location:
Date of departure: Date EPIET fellow(s) departed for the field
Date of return: Date EPIET fellow(s) returned

Abstract

Half page or less:

- What was the problem?
- What was done to address the problem?
- What was found?
- What conclusions were drawn?
- What recommendations were made?
- What public health actions were taken?

Background

Nature of the problem and its public health importance:

- Problem description
- Sequence of events leading to the study or investigation
- Why was an investigation undertaken?

Contacts in the field and investigation team
Pertinent background information and situation upon arrival:

- Geographic setting
- Size of community/hospital, etc
- What had been done so far?
- What was known to date?
- Brief statement of the working hypothesis

Objectives of the investigation

Methods

Case definition

Clinical, laboratory, time, place, person

Case finding methods

Source and mode of data gathering (telephone, interviews, record review, etc)

Analytical study-design and rationale

Case-control study

- Control definition
- Control selection
- Definition of exposure(s)
- How was exposure measured and categorised?

- What measure(s) of association were chosen?
- What statistical test(s) were chosen?
- Rationale for stratified and multivariate analysis, if any

Cohort study
- Definition of exposure
- How was exposure measured and categorised?
- What measure(s) of association were chosen?
- What statistical test(s) were chosen?
- Rationale for stratified and multivariate analysis, if any

Cross-sectional, etc
- Idem

Laboratory methods
- Type of samples
- Laboratory examination and methods
- Further typing

Environmental studies
- Type of inspection
- Method for sample collection

Other studies

Results

Descriptive findings
- Response rates
- Number of persons meeting case definition
- Overall attack rate (AR)
- Description by
  time (epidemic curve)
  place (AR by place)
  person (clinical features, AR by demographic characteristics)

Laboratory findings
- Number of samples tested and found positive
- Typing results

Environmental study findings
- Number of samples tested and found positive
- Comparison with human samples

Transition
- What do the descriptive results suggest in terms of risk groups, source, mode of transmission, exposure?
- Hypotheses generated that will be subsequently tested in analytic studies.

Analytical study results
- Proceed from general to particular
- From univariate to bivariable to multivariable (stratification and then regression) analysis.

Further studies performed, if any
Pending results, including lab

Discussion

Main results

Our investigation suggests that ……

Refutation of findings (Validity)

- Limitations of study design
- Possible biases (information, selection, confounding) that may have lead to the observed results.

Inferences from analytic study results

- Whether the findings fit with what is known about the disease
- Which criteria of causality have been met.

Conclusions

- Present a logical, clear interpretation of the results; explain how the working hypothesis is confirmed or disproved by the results.

Recommendations, actions

- Feasible recommendations for prevention/control measures based on public health implications of the findings.
- Rationale for recommendations and actions
- Further or future studies needed

Signatures of investigators and supervisors

Tables

- With a complete legend including time, place, person.

Figures

- With a complete legend including time, place, person.

References

Vancouver style

Appendix 5: Example of an outbreak investigation report

Date:	25 September 1996
To:	Director of Public Health, Eastern Health Board
From:	Thomas Grein, EPIET Fellow, EHB
Subject:	Salmonella typhimurium outbreak
Location:	Malahide, County Fingal
Date of departure:	N/A
Date of return:	N/A

Abstract

An outbreak of salmonellosis occurred among 127 persons attending a wedding reception on 21 August 1996. Of 115 interviewed guests, 57 (50%) met the case definition (diarrhoea within three days after having eaten at the reception). Thirty-eight cases visited their GP, seven were admitted to hospital. Forty-six cases submitted stool samples, of which 39 were culture positive for Salmonella typhimurium. Turkey was identified as the most likely vehicle for this outbreak (relative risk ¥). Environmental investigations at the catering facilities showed deficiencies in food hygiene practices. Eight of 17 asymptomatic kitchen workers carried S. typhimurium in their stool.

We recommended: to exclude all symptomatic food handlers from work in the hotel kitchen for 48 hours after their first normal stool; to educate food handlers and other personnel in the hygienic preparation and serving of food; and to immediately address the structural and operational deficiencies in the hotel kitchen.

Introduction

Nature of problem
Public health importance
Sequence of events leading to investigations

On 26 August 1996 the Eastern Health Board (EHB) was informed of an outbreak of gastrointestinal illness among guests of a wedding party that was held in a large hotel in Malahide on 21 August 1996.

Many guests had fallen ill since the reception and some had required hospitalisation. Malahide is a popular seaside town approximately twenty kilometres north of Dublin City.

Objectives of investigation

The same day the EHB started an investigation to assess the extent of the outbreak, identify the mode and the vehicle of transmission, and initiate appropriate control measures.

Composition of field investigation team

Dr. Darina O'Flanagan, Specialist in Public Health Medicine at the EHB, led the epidemiological investigations. She was assisted by Dr. Thomas Grein, Fellow of the European Programme for Intervention Epidemiology Training. Mr.Tom McCarthy, Principal Environmental Health Officer for food hygiene North Dublin City with special responsibility for communicable disease, and Mr. Derek Bauer, Principal Environmental Health Officer for County Fingal, led the environmental investigations and supervised the implementation of control measures.

Materials and Methods

Case definition

Case definition
Note: Only clinical case definition was used. If others would have been used, describe them here.

We defined a case as a person who had consumed food at the wedding reception on 21 August 1996 and developed diarrhoea (three or more loose stools in 24 hours) within the next 72 hours.

Case finding

Source and mode of data gathering

We obtained the addresses and telephone numbers of all 127 attendees of the wedding reception. Hotel management provided a copy of the menu and a list of all food items served during the reception.

Starting 27 August 1996, Environmental Health Officers (EHOs) conducted personal interviews at the homes of all wedding guests. Hospitalised cases were interviewed after discharge from hospital. Information was obtained on demographic details, symptoms of gastrointestinal illness three days prior to and after the wedding reception, the time of onset and the duration of symptoms, contact with ill persons not related to the wedding party, secondary spread among family members, foods consumed during the reception, whether the family doctor was contacted because of the illness, whether hospitalisation was required, and length of hospital stay if admitted.

Analytical study design

Type of analytical study
Rationale

We conducted a retrospective cohort study to identify the potential vehicle of the outbreak. The retrospective cohort design was chosen because information could be obtained on a clearly identifiable risk group.

Definition of exposures

Definition of exposure. The outbreak occurred among 127 guests who attended the wedding reception in the hotel on 21 August 1996. The main meal was served to 108 guests at 1800 hours on 21 August 1996. The meal consisted of honeydew melon, roast turkey, baked Irish gammon (ham steak), a selection of vegetables and potatoes, and chocolate eclairs for dessert. At 2200 hours sandwiches (turkey, ham, chicken, salad, savoury, egg, cheese) were offered to the guests and consumed by 58 individuals. Hotel staff prepared all dishes and sandwiches in a kitchen on the premises except for a home-made birthday cake and a home-made wedding cake. Both cakes were brought into the hotel by guests and consumed throughout the evening. To identify potential risk factors for illness, all guests were asked if they had consumed any of these food items

The restaurant of the hotel caters for hotel guests and a large number of visitors. No other functions were held on the day of the wedding reception. The number of persons who attended the restaurant on 21 August 1996 is unknown.

Chosen measures of associations and statistical tests

Analysis of the data was performed with Epi Info software, version 6.041. Food specific attack rates (AR), relative risks (RR) and 95% confidence intervals (95% CI) were calculated for the consumption of food items. The c2 test was used to compare proportions between groups.

Laboratory investigations

All interviewed persons who reported an illness were asked to provide a stool sample. Stool samples were also collected from some individuals who attended the wedding reception but did not become ill. Most specimens from non-cases were obtained from household members of cases. All specimens were submitted to the Public Health Laboratory for culture. Faecal specimens were also obtained from the 17 kitchen workers who were on duty during the week of the wedding reception, regardless of their symptoms.

Environmental investigations

Environmental investigations
Type of inspection
Methods for sampling

Starting 26 August, EHOs inspected the restaurant and the hotel kitchen on several occasions, investigated food handling practices and interviewed all food handlers for illness one week prior to and after the wedding. They examined transport, storage and preparation processes for the foods served at the wedding reception, and reviewed order and delivery books of the restaurant. The ingredients of incriminated foods were identified and traced to their sources.
Food specimens from the day of the wedding were no longer available when investigations commenced. EHOs sampled the same type of food items which were mentioned on the wedding reception menu and submitted them for culture on 27 August 1996.

Results

Descriptive findings

Eligibility
Response rates

Of the 127 wedding guests, four individuals had not eaten at the wedding reception and were excluded from the study. None of them reported an illness. Five guests refused to participate in the study and three guests could no longer be contacted. The remaining 115 (93%) individuals were interviewed (table 1). Sixty-two (54%) of them were female, 100 (87%) between 15 and 64 years of age (table 2).

Sixty-eight guests reported an illness during the interview. The case definition could be applied to 57 individuals. The overall attack rate among guests was 50%.

Number of persons meeting case definition. Overall attack rate

Dates and times of onset of illness for the 57 cases are shown in figure 1. There was a steady increase in the number of cases, starting in the night of 21 August, peaking during 22 August and declining over the next 48 hours. Two individuals developed diarrhoea on 25 August 1996 but were not included as cases. The median time (range) between the main meal and onset of illness in cases was 24 (5-72) hours.

Time

Males were 1.3 times (95% CI 0.9 - 1.9) more likely to be a case than females. Guests older than 65 years had the highest attack rate (100%) and were 2.3 times (95% CI 1.7 - 3.2) more likely to become ill than guests 45- 64 years who had the lowest attack rate with 43%.

Person

The main symptoms of cases were diarrhoea (case definition, 100%), feeling feverish (89%), general malaise (88%) and nausea (81%). Vomiting was reported less frequently (47%). The duration of illness ranged from two hours to 13 days with a median of five days (table 4).

Clinical features

Individuals who ate only during the late meal had a 1.7 times (95% CI 1.0 - 2.6) higher risk of illness than individuals who only ate during the main meal. The attack rates for guests seated at different tables varied between 25% and 80% (c2 = 11.3, p = 0.42). The age and sex distribution of guests seated at tables with higher attack rates (table 5 and 11) was not different from the distribution of guests seated at tables with lower attack rates (table 3).

Place

Forty-six (81%) cases provided stool samples. Thirty-nine (85%) samples were culture positive for *Salmonella typhimurium.* All isolates showed the same resistance pattern to Ampicillin, Amoxycillin, Chloramphenicol and Sulphonamides. One culture was phage typed at CDSC London (Definitive Type 104). An increase in the number of *S. typhimurium* isolates unrelated to the outbreak was not observed by hospital laboratories in the EHB area during this period.

Laboratory results

The rapid increase and decline in the number of cases, the single peak, the common exposure to food consumed at the wedding reception and the absence of an increase in other laboratory-detected cases of *S typhimurium* suggested a foodborne point source outbreak among the wedding guests (figure).

Summary descriptive findings:
Identifiable risk groups?
Mode of transmission?

Food specific attack rates, relative risks and percentage of cases exposed to the food items consumed at the wedding reception are given in table 5.

Analytical study results

For seven food items, cases had higher attack rates than non-cases: turkey (RR ¥), savoury sandwich (RR 1.85), birthday cake (RR 1.61), egg sandwich (RR 1.56), chicken sandwich (RR 1.43), ham (RR 1.22) and turkey sandwich (RR 1.12).

Univariate analysis

There were no cases among guests who had not eaten turkey during the main meal. Of the 57 cases, 52 (91%) had consumed turkey during the main meal

Environmental investigations

Environmental investigations

EHOs noted 23 violations of the food hygiene regulations during the kitchen inspections. Relevant findings with regard to the wedding outbreak were that frozen food was thawed in hot water, cooked meats cooled down at room temperature for indeterminate times and that storage practices in the cold room allowed for possible cross-contamination of raw meat.

Food items from hotel kitchen and bar buffet were sent to the laboratory on 27 August 1996. The only positive microbiological finding was found for a sample of cooked turkey (*Salmonella agona).*

The examination of the kitchen delivery dockets revealed that ten turkeys were delivered to the hotel on 19 August. Six of the ten turkeys were used for the wedding reception. Each of them weighted 20-24 lb. and were cooked on 20 August at 250oC for thirty minutes and at 180oC for two and a half hours. After cooking they were put into a non-refrigerated holding cabinet, left at room temperature to cool down, and later removed to the cold room. We could not determine how long the turkeys were left in the non-refrigerated holding cabinet. Other turkeys, cooked at midday on 21 August, were left overnight in the holding cabinet before being removed to the cold room.

Seventeen kitchen workers were interviewed and stool samples obtained from them. None reported an illness but eight (47%) stool samples were culture positive for *S. typhimurium*. Antibiotic resistance was determined for some isolates and matched that of the cases (resistant to Ampicillin, Amoxycillin, Chloramphenicol, Sulphonamides).

Discussion

Summary of key findings with regard to objectives

The primary objectives of our study were to identify the mode of transmission, the vehicle of the outbreak and to initiate appropriate control measures. Our data suggest that the vehicle of the outbreak was turkey served during the wedding reception on 21 August, and the infecting agent *S. typhimurium* DT104.

Validity of epidemiological findings

The relative risk for the consumption of turkey was infinite. There were no cases among guests who had not eaten turkey during the main meal. Of the 57 cases, 52 (91%) had consumed turkey during the main meal. Six other food items showed statistically significant relative risk estimates greater than. However, all of these food items were consumed by a small number of cases which makes them implausible vehicles for this outbreak. Thus epidemiologically turkey appears to be the most likely vehicle for this outbreak. Isolation of *S. typhimurium* from the stool of cases supports this finding as the pathogen is frequently found in poultry. Eighty-five percent of the stool cultures available for the cases were positive for this organism.

Limitations of study design

As the epidemiological data were obtained from a non-controlled, observational study some limitations apply to our results. All data were collected by personal interviews and could not be verified. Some information bias is likely to have existed, particularly after interviewees learned through the media about legal proceedings and compensation claims. Although most interviews were conducted within a week following the outbreak recall bias may have led to wrong exposure status. Selection bias is unlikely to have influenced our findings as the participation in the study was high (93%). As most guests ate the same foods stratification for possible confounding could not be performed for most food items. As we did not enquire about the amounts of food consumed we were unable to calculate dose response.

Do results from environmental investigations support findings?

The environmental investigations support our epidemiological findings and revealed severe deficiencies in food handling practices in the hotel kitchen. Stool samples from eight of the 17 kitchen staff on duty during the week of the outbreak were also positive for *S. typhimurium* suggesting that the infective food was prepared and consumed in the hotel kitchen.

Six turkeys were identically prepared on the same day and served at 12 tables. We could not determine if the meat of a whole turkey was served to specific tables or if the meat of all six birds was cut into pieces and then distributed randomly to all 12 tables. Attack rates for the tables vary between 25% and 80% without statistically significant differences. As every table had at least two cases it is more likely that meat of one or more infected birds was served to all tables. The mode of contamination remains unknown. Poor foodhandling practices may have allowed for one infective turkey to cross contaminate others, or contamination may have occurred by an asymptomatic, culture positive food handler.

Causality criteria

Our findings are consistent with other foodborne outbreaks related to the consumption of turkey. It is also a biologically plausible vehicle for the aetiological agent, *S. typhimurium.* The

implicated exposure preceded illness. Consumption of turkey was positively associated with illness and this association was stronger than for other food items.

More cases, unrelated to the wedding reception, came to our attention. Of five golfers lunching in the same hotel on the day of the wedding reception three fell ill within the next 24 hours. Interviews were conducted with the group. The main symptoms of the three ill individuals were diarrhoea and general malaise lasting between four and ten days. All three had consumed turkey salad sandwiches, the other two unaffected golfers cheese sandwiches. A stool sample was available for one ill individual which was culture positive for *S. typhimurium* (no definite type available). These additional cases strongly support the hypothesis that turkey was the vehicle of the outbreak and *S. typhimurium* the infecting agent.

Relevant results from other studies not part of this investigation

The Department of Agriculture was informed about the outbreak and subsequently investigated the poultry farm where the turkeys originated. S*. typhimurium* was detected in the dust of one of six turkey houses examined. According to a spokesperson of the Department this is a rare finding on Irish poultry farms. Further investigations are pending.

Recommendations, actions

Recommendations, actions

We recommended to exclude all symptomatic food handlers from work in the hotel kitchen for 48 hours after their first normal stool. We also advised to educate food handlers and other personnel in the hygienic preparation and serving of food and to implement the National Standard Authority of Ireland (NSAI) guideline 340:1994 - Hygiene in the Catering Sector4. The structural and operational deficiencies in the hotel kitchen were outlined in a detailed report and hotel management was urged to correct these deficiencies immediately.

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Table 1 Study characteristics. Wedding reception, Malahide, 21 August 1996

	number (percent)
Wedding cohort	127 (100)
Eligible	123/127 (97)
Refused to participate in study	5/123 (4)
Unable to locate	3/123 (2)
Interviewed (response rate)	115/123 (93)

Table 2 Demographic details of cohort. N = 115. Wedding reception, Malahide, 21 August 1996

	number (percent)
Age class (years)	
5-14	2 (2)
15-44	46 (40)
45-64	54 (47)
> 65	6 (5)
Unknown	7 (6)
Female	62 (54)

Figure Date and time of onset of diarrhoeal illness among cases. n = 57. Wedding reception, Malahide, 21 August 1996

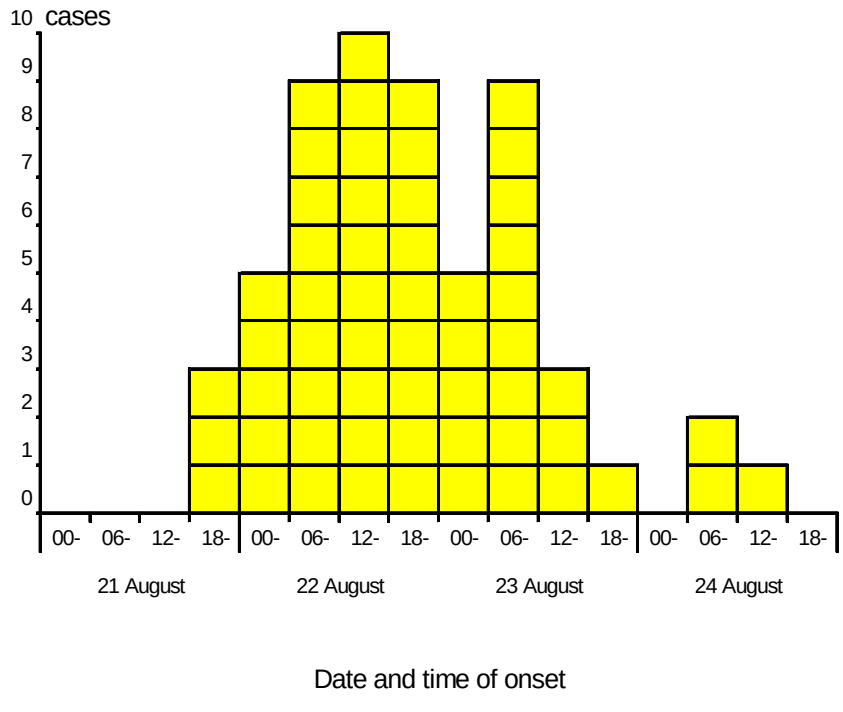

Table 3 Characteristics of cases with attack rates, relative risks (RR) and 95% confidence intervals (95% CI). n = 57. Wedding reception, Malahide, 21 August 1996.

	number	attack rate (%)	RR (95% CI)
All cases	57	57/115 (50)	
Sex			
Female	27	27/62 (44)	
Male	30	30/53 (54)	1.3 (0.90-1.89)
Age class * (years)			
5-14	1	1/2 (50)	1.2 (0.28-4.86)
15-44	25	25/46 (54)	1.3 (0.85-1.92)
45-64	23	23/54 (43)	1.0
65 +	6	6/6 (100)	2.3 (1.72-3.20)
Meals			
Main meal only	57	24/57 (42)	
Late night meal only	7	5/7 (71)	1.7 (0.97 - 2.57)
Seating arrangements #			
Table 1	3	3/10 (30)	1.2 (0.3-5.5)
Table 2	3	3/8 (38)	1.5 (0.3-6.7)
Table 3	5	5/10 (50)	2.0 (0.5-7.7)
Table 4	2	2/5 (40)	1.6 (0.3-8.0)
Table 5	7	7/10 (70)	2.8 (0.8-9.9)
Table 6	4	4/10 (40)	1.6 (0.4-6.6)
Table 7	4	4/8 (50)	2.0 (0.5-8.0)
Table 8	4	4/9 (44)	1.8 (0.4-7.3)
Table 9	2	2/8 (25)	1.0
Table 10	3	3/9 (33)	1.3 (0.3 - 6.1)
Table 11	8	8/10 (80)	3.2 (0.9 - 11.1)
Table 12	5	5/8 (63)	2.5 (0.7 - 9.3)

* $\chi 2 = 7.5$, $p = 0.057$; for seven individuals no information about their age

\# $\chi 2 = 11.3$, $p = 0.42$; seven guests attended only late night meal (no tables assigned), for three guests table number unknown

Table 4 Clinical and laboratory details of cases. n = 57. Wedding reception, Malahide, 21 August 1996

	number (percent)	median (range)
Symptoms		
Diarrhoea	57 (100)	
Feeling feverish	51 (89)	
Aches and pains	50 (88)	
Nausea	46 (81)	
Abdominal cramps	28 (49)	
Vomiting	27 (47)	
Headaches	16 (28)	
Blood seen in / on stool	4 (7)	
GP visit	38 (67)	
Hospitalisation	7 (12)	
Time in hospital (hours)		96 (6 - 312)

Duration of illness (hours)		120 (2 - 312#)
Incubation period (hours)		24 (5 - 72)
Stool samples obtained	46 (81)	
Stool sample +ve for Salmonella typhimurium	39/46 (85)	

[#] Sixteen cases were still symptomatic at time of interview, thus upper range > 312 hours

Table 5 Food specific attack rates (AR), relative risks (RR), 95% confidence intervals (95% CI), and percent of cases exposed. Wedding reception, Malahide, 21 August 1996.

	food eaten			***food not eaten***				***95 %***	***% cases exposed***
	cases	***total***	***AR %***	***cases***	***total***	***AR %***	***RR***	***C.I.***	
Main meal									
Soup	48	102	47	4	6	67	0.71	0.39-1.29	84
Turkey	52	104	50	0	4	0	∞		91
Ham	48	98	49	4	10	40	1.22	0.56 - 2.70	84
Melon	47	100	47	4	7	57	0.82	0.42-1.61	82
Carrots	46	96	48	4	8	50	0.96	0.46-1.98	81
Potatoes	46	98	47	6	10	60	0.78	0.45-1.35	81
Croquettes	43	84	51	7	19	37	1.39	0.74-2.59	75
éclair	41	90	46	11	17	65	0.70	0.46-1.07	72
Stuffing	40	84	48	11	21	52	0.91	0.57-1.45	70
Cauliflower	40	84	48	12	23	52	0.91	0.58-1.43	70
fresh cream	17	44	39	33	62	53	0.73	0.47-1.13	30
coffee cream	8	14	57	44	93	47	1.21	0.73-1.99	14
Scampi	2	4	50	50	104	48	1.04	0.38-2.83	4
wedding cake	25	53	47	27	54	50	0.94	0.64 - 1.39	44
birthday cake	12	17	71	40	91	44	1.61	1.09 - 2.36	21
Sandwiches									
Turkey	3	5	60	23	43	53	1.12	0.52 - 2.42	5

Ham	12	24	50	16	26	62	0.81	0.49 - 1.34	21
Cheese	9	16	56	21	36	58	0.96	0.58 - 1.61	16
Egg	8	10	80	21	41	51	1.56	1.02 - 2.40	14
chicken.	3	4	75	23	44	52	1.43	0.76- 2.70	5
Savoury	3	3	100	26	48	54	1.85	1.42 - 2.39	5
Main meal and/or sandwiches									
Turkey	53	105	50	2	8	25	2.02	0.61 - 6.81	93
Ham	51	104	49	6	10	60	0.82	0.48 - 1.41	89

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References
Vancouver style

Appendix 6: Guidelines for Contributorship and Authorship in Peer-reviewed publications

According to the "Uniform Requirements for Manuscripts Submitted to Biomedical Journals" (http://www.icmje.org/urm_main.html), persons who have provided an intellectual contribution to a manuscript should either qualify as contributors or authors.

Authorship should be based on
1) substantial contributions to conception and design, acquisition of data, or analysis and interpretation of data;
2) drafting the article or revising it critically for important intellectual content; and
3) final approval of the version to be published.

Authors should meet conditions 1, 2, and 3. Acquisition of funding, collection of data, or general supervision alone does not constitute authorship. Each author should have participated sufficiently in the work to take public responsibility for appropriate portions of the content.
All other persons who contributed to the work should be mentioned as contributors (usually in the acknowledgments).

To increase the visibility of EUPHEM, the fellow should mention the name(s) of the EUPHEM coordinator(s) who reviewed the manuscript in the acknowledgment section. If one of the coordinators contributed substantially to the conception, design analysis, as well as the revision of the manuscript, he or she may qualify for authorship. This authorship has to be decided on a case-to-case basis in accordance with the local supervisor.

Acknowledgements as well as authorship need to receive approval by the persons included. In addition fellows need to obtain clearance for their abstracts or manuscripts from EUPHEM coordinators and all national or international institutions (i.e. WHO) involved in the work.

Appendix 7: Guidelines for giving oral presentations or preparing a poster

The best insurance for giving a good presentation is careful preparation. While talks will differ in style and approach, a suggested framework to prepare an oral presentation is given below.

Preparing an oral presentation

You cannot speak effectively to an audience if you do not know who the people in the audience are. Before you begin planning your presentation, analyse your audience with regard to their professional and personal characteristics:

- Knowledge of the topic
- Technical expertise
- Educational and cultural background
- Their expectations from your presentation
- Their position in their own organisations
- Others

Find out about the facilities available during your presentation. The sooner you know, the easier the planning will become:

- What is the size and location of the room, how many persons will attend?
- What are the light conditions?
- What is the distance between you and the first row?
- What is available: laptop, projector, pointer, microphones?
- At what time of the day is your talk (i.e. after lunch, at the end of the day)?
- Is translation needed/available?
- Who does the logistics?
- Ideally, you can attend talks of other presenters before your own presentation to familiarise yourself with the conditions.

Structure

You cannot tell everything in a limited time -- be selective. Concentrate on the main lines and avoid very technical issues (e.g. do not provide the derivation of a complex formula. If somebody wants to know, he/she can consult your report).

Scientific presentations contain the key components of a scientific article – Introduction, Methods, Results, Discussion and Recommendations.

- **Introduction** - use it to set the scene and provide a brief outline.
- **Methods, Results** - group most of the information under three- five main themes.
- **Conclusion** - recap and interpret the main points of the presentation. Do not forget recommendations!

In **presentations to a non-scientific audience** (e.g. to public health decision makers where the main aim is to persuade rather than to inform), the following style can be used/adopted:

- **Opening remarks** - to establish contact with the audience and explain why the topic is important
- **Purpose of presentation** - to inform audience of the perspective you are going to offer on the topic of your talk
- **Steps of presentation** – to enable audience to grasp the structure of your talk and aid their understanding of it.
- **Main body of presentation** -- logically arranged with adequate detail or examples to back up your main points.
- **Recommendations**
- **Summary**
  - Key points – to provide a clear reminder of the areas addressed
  - SOCO (Single Overriding Communication Objective)

Choose your visual aids

The purpose of slides is to save time, increase interest and attentiveness, clarify or emphasise an idea and increase audience recall of presented information. Remember that PowerPoint slides are only there to enhance/reinforce you performance, not to detract from the point you are making so keep them simple. The most common problem with slides is overcrowding. The print on a slide should be readable without magnification. To help simplify slides consider the following:

- Do not try to tell the whole story on one slide. Use key words only, (think in terms of headlines), not long lists of words or whole paragraphs. Audiences won't be able to concentrate on what you are saying if they are expected to read text on a slide.
- Convey only one main idea per slide.
- Express ideas in as few words as possible.
- If needed, consider including handout material containing extensive detail to supplement a more simplified slide.
- Instead of one complex slide make several simplified slides with a conclusion slide describing the overall concept.
- Use pictures, simple diagrams, graphs or tables where possible rather than text.
- Use a large point size (30pt) and a sans-serif font (Arial, Tahoma). Use upper and lower case, not all upper. If you want to emphasise a point use your voice not upper case text on a slide.
- A good general rule is not to exceed six lines, or 45 characters and spaces per line.
- Use contrasting colours for good legibility; for example dark-coloured fonts for texts on light background.
- Do not put yourself in a position to have to apologise for your slides. If you introduce a slide by saying "You may not be able to read this, but..." then simply do not show it.
- Choose to acknowledge your co-authors on the title, second or last slide. Avoid logos except for the title slide.

Choose appropriate style

- Think about your presentation as a performance. You need energy and enthusiasm to deliver what you say and grab the attention of your audience.

- Consider the tone and degree of formality which will be expected from you as the presenter.
- Use short, simple sentences, and concrete language.
- Try to get as much light and shade in your voice as possible, use it to emphasise key words and phrases.
- Speak at a normally slow rate. As a rule of thumb, a double-spaced page printed in Arial will take about two minutes to deliver orally. Speaking slowly is particularly important if the audience is composed of speakers of a different language than the one you are presenting in.
- Use transitions to help the listener as you move from point to point.

The biggest question for many: to read or not to read?

- When a speaker writes the entire speech and reads it, the presentation usually does not sound "natural". Thus you may want to choose not to read when the audience is relatively small (e.g. 30-40 people or less) and you are well-prepared and confident about the topic. You can use index cards to guide you through your presentation by reducing the written copy to key phrases and points. Avoid using your own slides as prompt cards as this often means that you will turn your back to the audience to read them.
- Reading a well-prepared, well-rehearsed text is by no means inferior to "natural" speech. Reading will ensure that you will stay within your allotted time (an absolute must!) and that there will be no distracting "free associations". As size of the audience and importance of the event increase, even experienced speakers will tend to read their text.

Rehearsal

- Practice your talk for yourself and with your colleagues to make sure it runs smoothly and you have time to include all aspects. Check your presentation for voice, language, and timing. Some phrases look good on paper but are tongue twisters in actual speech. If you run over your allotted time during the rehearsal, shorten your presentation instead of speeding up its delivery.

The actual presentation

- Be thoroughly prepared and familiar with your material and the logistics.
- Do not apologise for the topic of your talk, or your lack of knowledge, or your English. If you lack confidence in yourself, the audience will perceive this and lose confidence in you.
- Make eye contact with members of the audience. Don't talk to the back wall or your notes. Find a few friendly, encouraging faces in different parts of the audience and talk to them.
- Keep to time. The standard length for oral presentations at a conference is 10-15 minutes. You should NEVER exceed the time limit. As a guide, the number of your Power Point slides should correspond to the minutes you have for the presentation.
- Avoid using laser pointers to highlight things on screen if possible. If you have to use them, use very briefly and sparingly as they are very distracting.
- Make short, simple, and specific statements.

- When something is important, say it slowly and loudly. Pause occasionally. Never be afraid to stop speaking for a moment.
- Thank the audience for their attention at the end of your talk.
- If a question & answer period is part of the presentation, try to anticipate possible questions and have answers ready. Prepare some additional backup slides which you could show to illustrate the answer to some expected questions.
- If you don't know an answer to a question from the audience, say so.
- Keep mannerisms at a minimum. Do not try to compensate your nervousness with being overly humorous.
- Always stay courteous and professional, even if you have to face an aggressive audience.
- Above all, be yourself.

Components of a Good Talk

- Interesting
- Speaker is prepared
- Simple, clear, and easy to understand
- Visual aids are easy to read and understand
- Speaker talks to audience
- Ends before or on time
- No excuse

Appendix 8: Guidelines for making poster presentations

Many people (including epidemiologists) consider posters to be less important than an oral presentation. However, the poster medium affords certain strong advantages in communicating the results of your research or investigation:

- Posters can be viewed during at least several hours
- Data and graphics on posters are available as long as an individual wishes
- The viewer can go forwards and backwards through the poster
- The poster allows you to more personally interact with the people who are interested in your research
- A poster attracts audience that is really interested in your work

Poster presentations are organised in **poster sessions**, and poster sessions belonging thematically to the same overall topic are organised in separate **poster areas.**

Poster papers minimise clashes caused by many parallel sessions and there is more time reserved for the presentation and for the viewing of poster papers than for oral ones. During the EPIET scientific seminar, over 50% of all presentations were poster presentations.

In general, for each poster a **poster board** is reserved with a clear dimension listed in the instruction for authors. The number of each poster paper and of its corresponding poster board is given in the appropriate session programme.

The **display time** is the time for the actual display of all posters of a poster session or of a group of sessions and displayed in the conference programme. Authors are asked to put up their posters as soon and to take them down as late as possible, in order to enable the conference participants to view their posters any time within this time allocation.

The **authors in attendance time** is the time when the respective authors of a poster session must be present at their display for presentation.

Preparing a poster

The standard format of a poster follows that of an oral scientific presentation and includes Introduction, Methods, Results, Conclusions; Recommendations. A poster, like an oral presentation, cannot (and should not) contain all information you have on the topic. Scientific posters should stimulate interest rather than provide a detailed presentation. If all text is kept to a minimum (1000 words), a person should fully read your poster in less than 10 minutes. Since there will be many other posters, you must make sure your poster is interesting and visually slick if you hope to attract viewers.

- **First, read the instructions** supplied by the meeting organisers! Having an idea about these details before you begin will make the whole process much easier.
- Re-read your **abstract** once again - are the statements still accurate? The presentation must cover the same material as the abstract. Do not include an abstract on a poster!
- **General guidelines:**

- Artistry does not substitute for content. The relevance of the poster to field epidemiology should be apparent to viewers.
- Think of the raw layout of your poster beforehand. Place the title at the top. Start with the introduction at the upper left, finish with the recommendations at the lower right, with methods and results filling the central space.
- Use short sentences, simple words, and bullets to illustrate your points.
- Text should be broken up by including graphics or photos.
- Self-explanatory graphics should dominate the poster. The success of a poster directly relates to the clarity of your illustrations and tables!
- Avoid using jargon, acronyms, or unusual abbreviations.
- Use a non-serif font (e.g., Arial) for the poster.
- The poster (text and graphics) should be easily readable from a distance of about 2 metres. As a thumb rule, the text should be readable if the poster is printed out on an A4 sheet (e.g. Arial >24 points).

- **Title:** Title should be in large fonts (e.g. Arial >80 points) and attract potential viewers. If possible, institute logos or affiliations should be minimised in size and put in the lower corner of the poster, or, alternatively, next to the title.
- **Introduction:** Get your viewer interested about the issue or question while using the absolute minimum of background information and definitions. Put the objectives of your study at the end of your introduction.
- **Methods**: Be short, but precise. State what study design you used and define your study population. Provide a case definition, if applicable. Mention statistical, laboratory and other methods that were used.
- **Results:** Briefly provide descriptive results (response rate, age and sex distribution). Present data that more specifically addresses the hypothesis and refer to supporting charts or images. Tables and graphs should stand on their own.
  - A minimal amount of text materials should supplement the graphic materials.
  - Use regions of empty space between poster elements to differentiate and accentuate these elements.
  - Graphic materials should be readable at a distance of 1.5-2.0 metres. The font size should be at least 1 cm high. Lines in illustrations should be larger than normal.
  - Use colours for emphasis, but do not overuse (2-3 colours are usually enough). Avoid using patterns or open bars in histograms.
  - Remove all non-essential information from graphs and tables (data curves not discussed by the poster; excess grid lines in tables).
  - Graphics and tables should have a complete title and legend.
- **Conclusion and recommendations:** Comment on main results and discuss why they are conclusive and interesting. Discuss potential biases. What are your recommendations?
- **Acknowledgments/further information:** Thank individuals for specific contributions to project; mention who has provided funding. Provide your e-mail address for further information.

Making the poster

- Preparing a poster takes time. Plan for a minimum of one week.
- Usually a presentation software such as PowerPoint will be used. Format your PowerPoint slide on the size you'll like to have it printed (ex 90x130 cm) by using the menu data -> format page. You can insert your text and graphics directly on that slide or copy-paste it from a Word document or a PowerPoint slide.
- Print the poster in an A4 format to check for layout, colours, font size and spelling errors before printing it in large size.
- After the poster is printed in large format, changes are no longer possible.
- It is often useful to make a handout of your poster for distribution during the poster session.

Usually, all the material necessary for attaching the poster to the poster board is available in the respective poster area. Still, you may want to bring some pins or thumbtacks, just in case.

An example of a poster (FETP India, source Dr. Yvan Hutin) can be seen here:

A poster should disclose key messages at first sight

You could even put a picture of yourself that will help people who want to find you among the 3,458 attendees of the conference

First Author [1], Second Author [2], Third author [3]
1. FETP trainee, Somewhere Pradesh, India 2. Supervisor, Training institution 3. Senior author, Ministry of Health
Version 3 - 9 April 2007 - Comments and suggestions welcome: Contact FETP India, WHO India country office

Background: Poster preparation is a challenging task

Getting started can be hard
- The motivation may be lower than for an oral
- Fewer classical rules are available
- Technical aspect may appear intimidating
  - Computer file handling
  - Printing

Be focused and short
- Don't overfill the space available
  - People stop in front of posters for a short time only
- Headings and graphs must summarize content

The technique is not too difficult
- Prepare slides as for an oral presentation
- Get comments and suggestions
- Cut and paste text and graphs into this template
- The file can be printed anywhere
  - Even at conference site

Methods: Use the space available to stretch out imagination and creativity

Display harmoniously
- The poster should look easy to read: Make it breathe!
- Get out of the usual frames: This is not a a set of slides!
- Colours and graphics serve your message and are not an end in themselves
- Prefer a light background (White takes less ink)
- Blend graphics into background
  - Use same colour (or white)

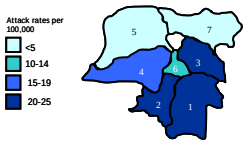
Step back for big picture vision
- Arrange the poster like the first page of a newspaper
  - Key points come across in a wink, in depth reading provides details
- Use the preview function to see the whole document.
  - Ensure that headings are readable
- Fine tune vertical alignment of text boxes
  - "Format"> "Text box"> "Position"

Results: Descriptive and analytical data can be shown at two different levels

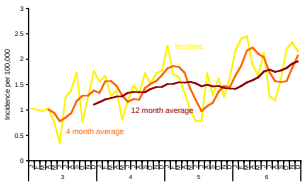
Descriptive epidemiology is at the top (vertical posters)

- Titles summarize the take home message
- The middle of the poster -at eyes level- draws attention to the results
- The lay out suggests a top to bottom and left to right reading sequence

Use of posters by scientists was clustered in few areas of the city



Rate of poster use by scientists increased with a seasonal variation in 2003-6



Adults used posters more

Characteristics		Cases	Population	Attack rate
Age	0-4	2	210	10
	4-14	23	444	52
	15-24	20	409	49
	25-34	22	320	69
	35-44	16	273	59
	45-54	14	181	77
	55-64	11	157	70
	>65	5	108	46
Sex	Male	57	1,066	53
	Female	56	1,036	54
Total		113	2,102	54

Analytical epidemiology is at the bottom (vertical posters)

- Short message -but not flashy graphs- was associated with acquisition of the message in a cohort study among the participants of the conference

	Rate of acquisition of the message		Relative risk	
	Among exposed	Among unexposed	Estimate	95% CI
Short message	89%	16%	5.7	2.6-13
Flashy graphs	76%	89%	0.85	0.74-0.97

Well in which bad posters were discarded

Here you can show the picture of whatever caused your outbreak

Limitation: Displaying everything is not possible

- A poster is not a paper: Packing all the findings is neither possible nor desirable
- Use the poster as a communication starter to generate a desire to stop by and ask questions
  - Prepare goodies: Business cards, reprints (e.g., poster, article), data tables
- Change dimensions and layout ("File"> "Page setup") if the meeting asks for different dimensions or for a horizontal design

Conclusion: A poster is a multi-layered communication method

1.Multiple reading levels allow obtaining the information quickly with as much details as desired

2.The poster is a large space that allows breathing

Recommendation: Lay out to get across different levels of details

1. Stratify the amount of details in the message by headings and sub-headings
2. Display the information with harmony as if arranging pieces of furniture in a room

Appendix 9: Matrix portfolio

The matrix of two years training is planed both vertically and horizontally. In horizontal part of the matrix seven core competencies (eighth domains) are located. In vertical part different disease group (DG) are allocated. At least four projects are expected to be performed by the fellow. Three are mandatory to be in outbreak investigation, surveillance and research. The forth one can be selected in any other competency domain (applied PH microbiology and laboratory investigation, biorisk management and quality management). These project should not be within the same DG but different. However a fellow might have outbreak investigation project as same as other projects due to unpredictability of the outbreaks. Public health microbiology management and teaching can also be covered in all are of the DG without blocking for additional projects in the same area. Beside the projects fellows will have activities which can be allocated in any DG. However it is recommended to avoid more than one activity within the same DG. This will contribute to a wide range of competencies in different disease programmes. Each project and main activities should result in an output in form of a manuscript or a report. If fellow has previously worked in one disease specific group this group should not be chosen for the projects of the fellowship. However fellows are recommended to provide with their previous competencies to the special needs when requested (e.g. outbreak investigation).

Table1: matrix portfolio

DP/Core comptencies	Outbreak investigation	Surveillance	PHM research	Management & Communica-tion	Biorisk management	Quality management	Lab investigation	Teaching	Other
Vaccine preventable disease									
Imported and emerging vector born diseases									

Hepatitis B and STD									
Respiratory disease (including flu and TB)									
Food and waterborne diseases									
Health care associated infections and antibiotic resistance									

Appendix 10: Project description form

Project proposal for EUPHEM fellows

PROJECT TITLE	**Please indicate if the project is an ECDC network contract**
Project (local) supervisor(s)	
Department where the project will take place and other key stakeholders **Please indicate if project is ECDC contract or is part of ECDC net work activities!**	
Aim and objectives of project	
Start date *(indicate if any flexibility)*	
Duration of project	
Time/sessions per week	
If data required, when will this be available?	
Location of project *(entirely at host site or will travel to other locations be required – if so please describe)*	
Which of the following learning objectives will the project meet? **Public health microbiology management and communication (aware/skilled)** • Design/organise/manage a public health microbiology laboratory • Asses risks to respond to a potential health threat • Apply the roles and responsibilities of local, national and international organisations involved in infectious disease control • Coordinate response using communication mechanisms and other tools • Communicate effectively with persons from a multidisciplinary	

background, authorities, the public and the media in the form of publications, reports, interviews, and oral presentations. **Applied microbiology and laboratory investigations (competent)** • Apply concepts of virology, bacteriology, parasitology/mycology and immunology to the public health disciplines • Identify the use and limitation of diagnostic and typing methods and their interpretation in patient diagnosis, outbreak investigations, surveillance and epidemiological studies • Recognise the specific issues with the use of laboratory and epidemiological methods in investigations of rare and emerging diseases • Design and apply safe specimen sampling strategies for disease surveillance and for outbreak detection and control, both in humans and animals **Epidemiological investigations, including surveillance and outbreak investigation (skilled)** • Set up surveillance systems (combined syndromic and laboratory based or only laboratory-based) • Analyse combined syndromic and laboratory or laboratory surveillance data • Evaluate an existing surveillance system • Operate microbiological support on surveillance systems • Apply combined microbiological and epidemiological knowledge in outbreaks, surveillance, or unusual events • Participate in an outbreak investigation with having one or more PH microbiology tasks. **Applied public health microbiology research (competent)** • Conduct all stages of a PHM research project, from planning to writing a scientific paper. **Quality management (skilled/competent)** • Describe quality assurance • Assess and experience different standards • Apply the concepts of external quality assurance (EQA) • Perform, evaluate or analyse results of an EQA. **Biorisk management (skilled)** • Apply national, European and World Health Organization (WHO) rules and regulations regarding biosafety and biosecurity and understand how these may influence response to an outbreak • Use appropriate decontamination strategies/personal protection and their applicability in field situations • Determine the need for quality management, biosecurity management, and crisis response as core elements of management of a public health microbiological laboratory. **Teaching (skilled/competent)** • Identify training needs, planning and organising courses • Moderate case studies, give lectures and perform pedagogical teaching • Design/create a case study.	

Briefly outline the work and responsibility that the fellow will be expected to take on *e.g. produce background papers, organise meetings, supervise staff and any other activities not mentioned under learning opportunities*	.
Project outcomes *ie: publication, meeting presentation etc.background papers, and any other activities not mentioned under learning opportunities*	.

Appendix 11: Different publication description / guide

Publish in a national or international bulletin

The target audience for bulletins may include public health professionals but also persons throughout the biomedical sciences and the general public, including the media.

Articles in PHM/epidemiological bulletins typically have two sections: news in a report section, and interpretation and comments in an editorial section. The emphasis in the report section is on descriptive PHM/epidemiology, study results without extensive description of the methods, recommendations, and action implemented. The editorial section emphasises the public health importance and consequences.

Publishing in a national or international bulletin is particularly useful for rapid dissemination of information and/or, if the information is judged to be of use to public health practitioners.

Articles for bulletins should be developed in accordance with the guidelines for authors of the bulletin. If not, observe style and format of previous issues. The following sections are usually proposed:

Publish in a peer-reviewed journal

If the health problem and/or the prevention/control measures merit a detailed analysis, publication in a microbiology or other biomedical journal should be considered. The following steps can guide the development of a scientific paper for submission to a biomedical journal:

- Develop the paper according to the publication guidelines of the journal.
- Obtain review and approval of the draft paper from the supervisor, EUPHEM and EPIET coordinators and all other appropriate individuals (e.g. co-authors, technical experts).
- Obtain clearance of the paper from the appropriate individuals and/or offices (training institutes) and submit the paper for publication through appropriate channels.
- Include reference to EUPHEM fellowship in the affiliation details and to sponsors if acknowledgements are made.

Give an oral scientific presentation or prepare a poster

Scientific oral or poster presentations during national or international meetings are an important way to disseminate methods and results of studies or investigations.

Within the two-year training programme, fellows should learn how to deliver an oral scientific presentation or prepare a poster during such meetings. It is expected that all fellows will have at least one oral presentation during an annual ESCAIDE conference or any relevant PHM confrance.

The pedagogical objectives of the communication activities are to acquire methodological skills and experience in:

- Knowing the purpose of the presentation (to inform, to persuade, or to entertain);
- Selecting the content of the message and the amount of information to be communicated;
- Knowing the audience (attitude, needs, demographics, specialty, size, location);
- Knowing the logistics (size and location of meeting room, ,size of poster board, etc);
- Organising and presenting information in a clear, attractive and logical format;
- Preparing visual aids in a simple, clear format which highlights important information and can be easily understood by the audience;
- Selecting and preparing suitable material;
- Answering questions raised by the audience;
- Coping with the stress associated with giving a presentation.

Submit abstracts to the ESCAIDE conference

EUPHEM fellows are expected to submit abstracts of their work to the annual ESCAIDE conference. The deadline for submission of abstracts is in late June or early July of each year. EUPHEM fellows need to share the draft abstract with co-authors, training supervisors and coordinators at least two weeks prior to the abstract deadline. Fellows can only submit abstracts that have been commented upon and cleared by the respective co-authors, training site supervisors and coordinators.

Prepare a scientific report

The findings of an outbreak investigation, PHM/epidemiological study, health hazard assessment, or surveillance activities should be summarised in a scientific report. Such reports serve operational, scientific, legal, and training purposes and can take several forms:

- Final field investigation report -- a complete and logically organised document without length constraints
- Short article for a national or international bulletin
- Paper for a peer-reviewed biomedical journal

Appendix 12: SPO International Assignments

International Assignments

Standard Operating Procedures

Working version submitted to ECDC and EAP Clearance, 26 March 2013

EPIET/EPIET-associated-programmes (EAP) & EUPHEM

Table of contents

1. BACKGROUND

The European Programme for Intervention Epidemiology Training (EPIET) and the European Public Health Microbiology Training (EUPHEM) are two-year fellowships designed to build the core competencies for European Union (EU) public health epidemiologists and microbiologists, respectively. Both programmes are part of the training activities of the European Centre for Disease prevention and Control (ECDC). EPIET works in close collaboration with a number of EPIET-associated programmes (EAPs), which are member-state run Field Epidemiology Training Programmes (FETP).

An **international assignment** is a short term deployment of a fellow for field work outside of the host institute country.

2. PURPOSE OF THIS DOCUMENT

This document describes the standard operating procedures (SOPs) for international assignments of EPIET/EUPHEM/EAP fellows for the shared use of:

- Public health institutes/agencies interested in offering opportunities for international assignments to fellows;
- Fellows;
- Training site supervisors;
- EPIET/EUPHEM/EAP scientific coordinators.

3. INTRODUCTION

Occasionally, ECDC, international organizations (WHO, UNCHR etc.), Ministries of Health (MOH, or their national institutes), Non-Governmental organisations (NGOs), and private agencies request assistance that offer fellows opportunities for international assignments. EPIET/EUPHEM/EAP encourages this participation, as long as the international assignment allows acquisition of programme-relevant competencies. According to the programmes' training objectives, all fellows should perform field assignments (e.g., outbreak investigations, surveillance projects, operational research projects and training of public health professionals for EPIET) to acquire the core competencies in field epidemiology or public health microbiology during their training [1,2].

4. DURATION OF THE ASSIGNMENT

Assignments (deployments) usually last two to four weeks. However, the duration of the assignment may vary depending on the request. The duration of the assignment includes time needed to finalise formal reports and articles.

5. INITIAL REQUEST

Depending on the requesting institute/agency, there are three types of assignments:

– "ECDC assignments". They refer to i) projects organized by ECDC or ii) requests addressed to ECDC, including the WHO Global Outbreak Alert and Response Network (GOARN) requests for assistance. Those assignments

require coordination within ECDC centrally and therefore, ECDC-based coordinators (EPIET/EUPHEM) handles those.

- "non-ECDC-related assignments", refer to requests coming from NGOs, MOHs and private agencies/institutes. The EPIET coordinator responsible for international assignments (international-assignment-coordinator) will be responsible for these assignments in agreement with EUPHEM chief coordinator. .
- EUPHEM-projects, refer to any requests for microbiologists. The chief EUPHEM coordinator is responsible for those.

The steps described below are applicable to all types of assignments.

Responsible coordinator (international-assignment-coordinator, ECDC-coordinator, or chief EUPHEM coordinator depending on the type of the assignment). He/she receives initial requests, decides if the assignment is suitable for fellows, finalises and circulates TORs and participates in the selection of fellows.	**Assigned coordinator** (usually the front-line coordinator). He/she offers scientific support to fellows during the assignment and comments on preliminary and final reports.

The procedure to follow:

- The requesting agency/institute prepares and sends to both the EPIET international-assignment-coordinator and the ECDC-coordinator(s) the Terms of Reference (TORs) for the assignment. The project opportunity form (Appendix 1) may be used as guidance to develop the TORs. A checklist for requesting agencies/institutes is provided in Appendix 2.
- The responsible coordinator (international-assignment-coordinator, ECDC-coordinator, or chief EUPHEM coordinator depending on the type of the assignment), decides whether the proposed assignment is appropriate for fellows. If the request is planned to be send to both EPIET and EUPHEM, an agreement with chief EUPHEM coordinator will be obtained in advance. Criteria for fellows' participation include:
  - Public health importance and scientific interest
  - Training opportunities provided by the assignment
  - Political and security issues
  - Availability of financial support

- Following acceptance, the requesting agency and the responsible coordinator review and finalise the TORs.
- The responsible coordinator circulates the finalised TORs, with a clearly indicated deadline by which to apply, to:
  - all the EPIET/EAP/EUPHEM fellows to offer them the opportunity to apply for the assignment or simply inform them,
  - all respective training site supervisors,
  - all EPIET/EAP/EUPHEM scientific coordinators
  - the EPIET fellowship programme office

6. Administrative arrangements

The requesting institute/agency arranges and covers the following expenses for the fellow:

(i) Briefing and debriefing opportunity at the requesting agency (if needed)
(ii) Daily allowance (per diem)
(iii) Travel and accommodation during the assignment (deployment)
(iv) Personal and equipment insurance during travel and assignment (including medical assistance and repatriation)
(v) Visa or other travel documents, including necessary medical check-ups, vaccination and chemoprophylaxis when appropriate
(vi) Financial support for future scientific communication / conference, if applicable

During the assignment, the fellows' salary will continue to be covered by ECDC, EAP or Member States. Fellows are not allowed to receive any additional financial compensation (salary/consultancy fee).

7. Application process for fellows

Interested fellows:

- Obtain approval from their:
  1. training site supervisor, who will take into account the fellow's workload and commitments at the training site.
  2. EAP or EUPHEM front-line coordinator (if applicable). Inform their front-line EPIET coordinator (for EPIET fellows).

- Send to the responsible coordinator, by the stated deadline:
  3. an updated CV
  4. a Letter of Motivation (LoM) (preferably in the language requested for the assignment),
  5. an updated fellowship portofolio ("fellowship summary progress report" for EPIET or "incremental progress report" for EUPHEM)
  6. the approval of the training site supervisor. The training site supervisor and the frontline coordinator are copied in this e-mail.

Fellows cannot apply to the requesting agency directly, unless otherwise agreed upon. A checklist for fellows is provided in Appendix 3.

8. SELECTION PROCEDURE

7. The responsible coordinator collects all the above-mentioned documents from the applicants and prepares a ranked list according to selection criteria specified below. Depending on the project and the number of candidates, the responsible coordinator may seek advice from the front-line coordinators of the candidates to finalise the ranking proposal.
8. The responsible coordinator sends the CVs and LoMs of all candidates to the requesting agency with the proposed ranking.
9. The requesting institute/agency makes the final decision on the selection of the candidates.
10. The responsible coordinator informs of the decision by e-mail:

11. all fellows,
12. all coordinators,
13. the fellowship programme office and
14. the Head of Public Health Training Section at ECDC.

The responsible coordinator will also post a "news item" informing about the selection of the candidate(s) on the front page of Extranet, under "News", to make the information accessible to all "Training Extranet" users. Users can tailor the site to send out e-mail reminders whenever a news item has been posted.

- The Head of Public Health Training Section at ECDC or the chief EPIET or EUPHEM coordinator informs the European Commission.
- The fellowship programme office requests the successful candidate about the exact dates of the deployment.
- Successful candidates go through the checklist for fellows before, during and after the assignment (Appendix 3).
- The international-assignment-coordinator keeps a record of all assignments.

9. Selection criteria

Some general criteria that coordinators take into account for the ranking of the fellows are the following:

1. Progress of the fellow towards achieving the training objectives and how the specific assignment may help him/her meet those
2. Technical skills and competencies, either present or not yet acquired
3. Technical skills and specific background/expertise required for the assignment
4. Previous international assignments
5. Ability to adapt to the specific environment
6. Languages spoken
7. Availability for the entire expected duration of the assignment
8. Equal opportunity to all fellows

In addition, selection criteria may vary according to the assignment and they are normally specified in the TORs.

10. Supervision in the field

Fellows are considered as fully-fledged professionals. The requesting institute/agency assigns a focal point that functions as a temporary "training-site" supervisor who is responsible for the fellow during the assignment and provides on site or "remote" supervision [1]. An "assigned" EPIET/EUPHEM/EAP scientific coordinator will also supervise fellows during the assignment. The assigned coordinator will be in contact with the fellow at least once a week during the deployment via e-mail or telephone and will organise a debriefing upon fellow's return.

11. Fellows' outputs and feedback from coordinators

In addition to the specific requirements for each assignment, the fellows are expected to provide the following outputs:

- A **preliminary report,** that is prepared before leaving the field. The fellow sends this report to the assigned supervisor and coordinator. The assigned coordinator will provide feedback within 48 hours. However, he/she may also offer scientific support during the whole period of the assignment. For EUPHEM projects, the chief EUPHEM coordinator is in charge of all communications and review of the outputs delivered by the fellow.
- A **final mission report** that the fellow forwards to the assigned supervisor and coordinator for comments before being finalised.

All products/deliverables of the assignments are subject to the rules on contributions, authorship, clearance and acknowledgements specified in the EPIET/EAP curricular process guide [1]. A data use agreement may be signed between the requesting institute/agency (or the training site during the assignment) and EPIET/EUPHEM/EAP, when appropriate.

12. International assignments directly organized by the training sites

Occasionally, EUPHEM/EPIET training sites directly organise international assignments for fellows. Procedure to follow is:

- The training site supervisor and the front-line coordinator (for EPIET/EUPHEM) check whether the proposed assignment is appropriate for the fellow, considering suitability and usefulness of the project for the fellow, security issues, and compatibility with ECDC rules.
- The training site covers all the costs of the international assignment including travel and accommodation, daily allowance, travel documents and insurance for the fellow.
- The training site supervisor and the front-line coordinator (for EPIET/EUPHEM) agree in advance on supervision of the fellow during the deployment and on site.
- EAP organized international assignments will be in accordance with local procedures.
- EAPs and EUPHEM/EPIET training sites inform the EPIET international-assignment-coordinator, who keeps a record of all international assignments offered to fellows.

13. Conflicts of interests

The organization of international assignments needs to avoid actual or perceived conflicts of interest. Therefore:

- Third parties providing opportunities should disclose the sources of funding that will be used to support the deployment of the fellow(s);
- The organization of international assignments needs to comply with ECDC's policy in terms of conflict of interest and collaboration with the private sector;
- Publications and reports that follow international assignments should disclose the source of funding that was used to support the fellows.

14. References

1. EPIET and EPIET-associated fellowships curricular process guide. ECDC 05 Dec 2012. Available at: http://www.ecdc.europa.eu/en/activities/training_activities/documents/epiet-scientific%20%20guide-2012.pdf
2. EUPHEM scientific guide. Available at: http://www.ecdc.europa.eu/en/activities/training_activities/EUPHEM/Pages/index.aspx

Appendix 1 - Project opportunity Form

European Programme for Intervention Epidemiology Training Project opportunity form [1]	
Title of the project	• Provide a short title for the project
Name, email and affiliation of contact	• Specify who is requesting the project
Location	• Specify where the fellow would have to work
Project rationale	• Justify the project in one line or two
Project objective	• Specify what the project should achieve
Methods to use	• Explain the general types of methods that should be used for the project (e.g., analytical epidemiological study, modelling, surveillance data analysis)
Data / information provided	• Outline the kind of data / information (e.g., database) you could provide for the project
Pre-requisite / background needed	• Specify what skills would be needed for the project (In addition to a mainstream EPIET background)
Timeline from start to finish	• Estimate the number of months that may be needed from the beginning to the end of the project. Specify dates if applicable.
Proportion of time to be assigned to the project	• Estimate the proportion of time that should be assigned to the project during the duration of the project
Description of the output / product	• Describe what the report should consist in (Body of the product + annexes if applicable) • Mention if this project could lead to an opportunity to publish
Technical supervision	• Mention who would be available to provide technical guidance, how much supervision would be available and what areas could be covered
Insurance	• Specify how the fellow will be covered in terms of insurance while on assignment
Funding available	• Travel: • Lodging and perdiem: • Support for future scientific communication / conference:

[1] May come before detailed " terms of reference "

Appendix 2 – Checklist for agencies/institutes requesting assistance

Request for assistance

- Send to the EPIET/EUPHEM coordinator the Terms of Reference (TORs) ☐
- Agree with the EPIET/EUPHEM coordinator on the final Terms of Reference (TORs) ☐
- Arrange and cover the following expenses for the fellow:

(vii) Briefing (including security and health issues) and debriefing opportunity ☐

(viii) Daily allowance (per diem) ☐

(ix) Travel and accommodation during the assignment (deployment) ☐

(x) Personal and equipment insurance during travel and assignment (including assistance and repatriation) ☐

(xi) Visa or other travel documents, including necessary medical check-ups, vaccination and chemoprophylaxis when appropriate ☐

Before sending the fellow to the field

- Select the most appropriate candidate based on the EPIET/EUPHEM ranking proposal ☐
- Assign a supervisor for the fellow (on site or "remote") ☐
- Arrange for travel, accommodation and insurance of the fellow during the deployment ☐
- Arrange for briefing (including security issues) ☐

While the fellow is in the field

- Provide communication means in the field including access to e-mails and/or telephones ☐
- Establish security standard operating procedures (if applicable) ☐
- Arrange medical care for the fellow (if needed) ☐
- Supervise the project and monitor the work plan so that the field assignment is completed ☐
- Provide feedback to scientific outputs/products delivered by the fellow ☐

Upon return

- Arrange for debriefing ☐
- Provide feedback to the final mission report and any other scientific outputs/products delivered by the fellow ☐

Appendix 3 – Checklist for fellows

Application

To do before applying: ☐

5. Obtain approval from training site supervisor

6. Obtain approval from EAP or EUPHEM coordinator (if EAP or EUPHEM fellow, respectively). Inform front-line EPIET coordinator (if you are an EPIET fellow). ☐

To do when applying:

7. Send to the responsible coordinator (cc supervisor and frontline coordinator), by the stated deadline:

- Updated CV ☐
- A Letter of Motivation (LoM) (preferably in the language requested for the assignment) ☐
- Updated fellowship portofolio ("fellowship summary progress report" for EPIET or "incremental progress report" for EUPHEM) ☐
- The approval from the training site supervisor ☐

In the field

To do before departure:

- Verify validity of the passport (some countries request validity for at least six months from the start of the travel) ☐
- Contact the requesting agency/institute for all travel arrangements ☐
- Provide the fellowship programme office and the assigned coordinator with the exact dates of your travel, your contact details (e-mail, telephone) during the deployment and details of a contact person (family) ☐
- Verify validity of immunization, start malaria prophylaxis (if needed) and check with requesting agency that immunization, malaria prophylaxis and emergency medical kits are available ☐
- Sign the appropriate insurance documents ☐
- Ask for security briefing

To do while in the field:

- Inform the assigned coordinator about safe arrival in the country of the assignment ☐
- Contact regularly the assigned coordinator (by e-mail or telephone, if possible once a week) ☐
- Comply to health and security rules ☐
- Prepare a **preliminary report** before leaving the field. Send it to the assigned supervisor and coordinator for comments. ☐

To do upon return:

- Produce all requested deliverables in time, according to terms of reference ☐
- Debrief the requesting agency ☐
- Debrief the assigned coordinator ☐
- Fill in all necessary justifications for reimbursement of expenses ☐
- Consult at an early stage relevant health specialists (if needed) ☐
- Prepare a **final mission report.** Send it to the assigned supervisor and coordinator for comments. ☐

Appendix 13: Template for midterm interview

EUPHEM Midterm interview

Cohort:	**Date**:
Name:	**Site**:
Overall impression of training	
Supervision (from coordinators), Please indicate strength as well as weaknesses!	
Objective of the programme (please point out any difficulties to reach your objectives)	
Objective achieved? Yes/No If not, what was the reason?	
Individual core competency objectives (please summaries and give your impression on particular objectives bellow and describe difficulties and benefits. Here you describe your projects and activities within different core competencies. Please indicate the procedure. Did you have problems or difficulties?	
PHM management	
Objective achieved? Yes/No If not, what was the reason?	
Applied PH microbiology and laboratory investigation	
Objective achieved? Yes/No If not, what was the reason?	
Outbreak investigation (please describe your interaction with epidemiologists)	
Objective achieved? Yes/No If not, what was the reason?	
Surveillance	
Objective achieved? Y/N If not, what was the reason?	
Applied PHM Research	
Objective achieved? Y/N If not, what was the reason?	
Biorisk management	
Objective achieved? Y/N If not, what was the reason	
Quality management	
Objective achieved? Y/N If not, what was the reason?	
Teaching	
Objective achieved? Y/N If not, what was the reason?	
Communication (please list all your communication output including abstracts, presentations, manuscripts and publications and describe any difficulties or suggestion for improvements)	
Objective achieved? Y/N If not, what was the reason?	
Modules (did you find the modules useful, relevant, easy to follow? which one you wish to change or modify? please describe)	
Site and supervisors: **Please describe if you faced any challenges and what would be your recommendations for improvements**	
Administration All reimbursement issues concerning insurance, pension and travel, missions	
Plans for year2	
Any suggestion for improvement of the programme	
Any suggestions to this form (add, delete, modify)	

Please complete the form and return it to both coordinators within one week.

Good Luck

Appendix 14: Check list for midterm interview

Check list for midterm interview

All the documents are collected on extranet (IPR, project descriptions, protocols, manuscripts, outbreak reports, mission reports)

1. All the documents are updated
2. IPR is updated
3. Modules (check with FPO and site supervisors) if fellow completed number of modules
4. Publications are listed (ask fellows to make a list of all published outputs)
5. Manuscripts (last versions)
6. Instruction for midterm interview is send
7. Questioner for interview is filled and send to the coordinators
8. Time for interview is booked (2h)
9. Coordinators agreed on the time together with fellow and supervisor

Appendix 15: Template for exit interview

EUPHEM exit interview

Cohort:	**Date:**
Name:	**Site:**
Overall impression of training	
Supervision (from coordinators)	
Objective of the programme (please point out any difficulties to reach your objectives)	
Objective achieved? Yes/No If not, what was the reason?	
Individual core competency objectives (please give your impression on particular objectives bellow and describe difficulties and benefits)	
PHM management	
Objective achieved? Yes/No If not, what was the reason?	
Applied PH microbiology and laboratory investigation	
Objective achieved? Yes/No If not, what was the reason?	
Outbreak investigation (please describe your interaction with epidemiologists)	
Objective achieved? Yes/No If not, what was the reason?	
Surveillance	
Objective achieved? Y/N If not, what was the reason?	
Applied PHM Research	
Objective achieved? Y/N If not, what was the reason?	
Biorisk management	
Objective achieved? Y/N If not, what was the reason	
Quality management	
Objective achieved? Y/N If not, what was the reason?	
Teaching	
Objective achieved? Y/N If not, what was the reason?	
Communication (please list all your communication output including abstracts, presentations, manuscripts and publications and describe any difficulties or suggestion for improvements)	
Objective achieved? Y/N If not, what was the reason?	
Modules (did you find the modules useful, relevant, easy to follow? which one you wish to change or modify? please describe)	
Site and supervisors: **Please describe if you faced any challenges and what would be your recommendations for improvements**	
Administration All reimbursement issues concerning insurance, pension and travel, missions	
Future plans	
Any suggestion for improvement of the programme	
Any suggestions to this form (add, delete, modify)	

Please complete the form and return it to both coordinators within one week.

Appendix 16: Check list for exit interview

Check list for exit interview (be sent in end of July, be returned in beginning of August)

10. All the documents are collected on extranet (IPR, project descriptions, protocols, manuscripts, outbreak reports, mission reports)
11. All the documents are updated
12. IPR is updated
13. Modules (check with FPO and site supervisors) if fellow completed number of modules
14. Publications are listed (ask fellows to make a list of all published outputs)
15. Manuscripts (last versions)
16. Executive summary is ready
17. Instruction for exit interview is send
18. Questioner for exit interview is filled and send to the coordinators
19. Time for exit interview is booked
20. Coordinators agreed on the time

EUROPEAN PUBLIC HEALTH MICROBIOLOGY (EUPHEM) TRAINING PROGRAMME

SITE APPRAISAL MANUAL

March 2012

Index

Introduction

"Public health microbiology (PHM)" is a cross-cutting area that spans the fields of human, animal, food, water, and environmental microbiology, with a focus on human health and disease. Public health microbiology laboratories play a central role in detection, monitoring, outbreak response, and providing scientific evidence to prevent and control infectious diseases. European preparedness for responding to new infectious diseases threats requires a sustainable infrastructure capable of detecting, diagnosing, and controlling infectious disease problems, including designing prevention, treatment and infection control strategies. A range of expertise is necessary to fulfil these requirements including epidemiology and public health microbiology. Public Health Microbiology is required to provide access to experts with expertise/experience of the important communicable diseases at the regional, national and international level for mounting a rapid response to emerging health threats, planning appropriate strategies for prevention, assess existing prevention disciplines in place/use, develop or assist in development of microbiological guidelines, evaluate/develop new diagnostic tools, arbitrate risks of microbes or their products, provide necessary information to policy makers related to above issues from a microbiology perspective.

According to article 5 and 9 of ECDC regulation (EC No 851/2004) "the Centre shall, encourage cooperation between expert and reference laboratories, foster the development of sufficient capacity within the community for the diagnosis, detection, identification and characterisation of infectious agents which may threaten public health and as appropriate, support and coordinate training programmes in order to assist Member States and the Commission to have sufficient numbers of trained specialists, in particular in epidemiological surveillance and field investigations, and to have a capability to define health measures to control disease outbreaks".
The investments in a European infrastructure for epidemiological work (EUPHEM), has stated clearly that the PHM speciality is in short supply. Therefore, the ECDC has initiated a two-year EU public health microbiology training programme (EUPHEM) closely linked to the European Programme for Intervention Epidemiology Training (EPIET). Both EUPHEM and EPIET are considered as "specialist pathways" of the 2 year ECDC fellowship programme for applied disease prevention and control.

Purpose of this document

This manual aims to give a detailed overview of the assessment of training sites. You will find criteria for becoming a training site, procedures to arrange a site visit, questions to be asked during a site visit and an example of a report. The present manual should help to standardise the site visits and can be shared with the training sites before the visit in order to assure a good preparation. The document looks both at initial site appraisals and follow-up site visits.

All forms in the Appendix section are to be seen as examples and are subject to change.

How to become an EUPHEM training site

Laboratories within National or regional public health institutes in EU Member States can apply to become a EUPHEM training site. In exceptional cases, national non-profit organisations could also apply to become a EUPHEM training site, provided that they correspond to the selection criteria (see below).

National public health institutes who want to host a EUPHEM fellow should signal their interest to the EUPHEM Chief Coordinator at ECDC. Regional public health institutes willing to become a EUPHEM training **site should first inform the national public health institute of their respective countries** before approaching ECDC/EUPHEM.

Whenever a public health institute or an organisation formally offers to become a EUPHEM training site, the following steps take place

1. The relevant record and output of the organisation is reviewed, in order to understand the level of involvement in the core activities of EUPHEM training (Public Health Microbiology Management, Applied microbiology and laboratory investigations, Epidemiological investigations (Surveillance and Outbreak investigation) Biorisk Management, Quality Management, Research in applied PHM). In addition these records should cover PHM disciplines (bacteriology, virology parasitology/mycology) and different diseases specific programmes according to matrix of EUPHEM (please see scientific guide)

- a site appraisal is conducted by at least one of the scientific programme coordinators and one senior supervisor from the existing training network or another expert from ECDC. The objective of the site visit is to assess the feasibility of hosting a EUPHEM fellow in the organisation.

Selection criteria for training sites

To be available as a EUPHEM training site, the public health institute or organisation will need to confirm that the following context can be offered:

- To provide access to activities in public health microbiology in covering different microbiology disciplines (Bacteriology, virology, parasitology/mycology) and areas of surveillance, outbreak investigations.
- To provide access to datasets and vital records.
- To provide personal supervision to a EUPHEM fellow by a senior public health microbiologist (at least 9 years experience) as main supervisor, a co-supervisor and a field epidemiologist, for at least 4 hours per week during the 23 months of the training. This includes regular supervision meetings and review of the fellow's work plans and output.
- To provide an adequate workspace for the fellow, including use of a laptop computer with sufficient office software, access to telephone, fax, internet and an e-mail address.
- To have funding for travels within the country to outbreak investigations etc
- To share all communication by e-mail on output, including early drafts, equally between fellow, supervisors and EUPHEM coordinators. This communication will always be considered confidential.
- Maintain good relationships within health department and access to other units in order to guarantee different projects.

Training site supervisors should

- Be familiar with and understand the training programme

- Have the responsibility and authority to manage a fellow
- Be in a permanent/long term contract position and
- Have the current position for at least one year or more to be sufficiently familiar with local setting of public health microbiology and epidemiology in their state
- Have the skills and experience as scientist and practitioner (including areas of publication)
- Be skilled as teacher and mentor
- Have experience and desire to supervise mid-career professionals
- Have an adequate experience in epidemiology
- Contribute to EUPHEM training modules as facilitators

The practical steps of the recruitment of new training sites are:

1. The public health institute or organisation should provide EUPHEM with a brief overview of the relevant activity and output of the previous 5 year(s), in relation to the EUPHEM
2. EUPHEM and the public health institute or organisation identifies a date for a formal site appraisal.
3. Depending on the outcome of the site appraisal, a training site agreement will be drafted between ECDC and the new training site.
4. The new training site appoints a senior microbiologist as a facilitator for at least 2 weeks in the next EUPHEM Introductory course.

The same procedure should be used for the evaluation of institutes willing to offer training for fellows staying in their countries of origin (associated EUPHEM programmes).

Initial site appraisal

Objective of the initial site appraisal

The initial EUPHEM site appraisal will be undertaken after a potential site showed interest in becoming a training site for fellows of the EUPHEM or EUPHEM-associated programmes. If requirement for becoming a site will change or condition at host site has changed site will be subject to a new site appraisal. The main objectives of these appraisals are to assess whether the site is able to offer enough supervision and activities in all training objectives for the potential fellow.

ECDC country visits preceding EUPHEM appraisals

A public health institute interested to become a EUPHEM training site might first request an official ECDC visit. The ECDC visits can cover a wide range of topics, including training. Training needs can be assessed during these visits by looking at existing training opportunities inside the country and the need for trained PH microbiologist in the future. The visiting ECDC delegation will explore how ECDC can support capacity building in the member state during these visits. One of the conclusions of these visits may be that the member state would benefit from becoming a EUPHEM training site. In these cases the ECDC country visit would be followed by a EUPHEM initial appraisal.

Visiting team

One EUPHEM coordinator and a representative from the EUPHEM Training Site Forum or a senior supervisor from one of the current training sites usually perform a follow-up site visit. Inviting supervisors from other sites to join the visit will provide them with an opportunity to compare the different sites and make improvements for the own site. Site visits are therefore regarded as "train-the-trainer" activities. In case that no supervisor is available two coordinators or one coordinator and one ECDC expert should perform the site visit. The EUPHEM coordinator is leading the team and is responsible for the final report.

During the site visit, the head of department, main supervisor, project supervisors and the fellow should all be present.

Preparation to an initial appraisal

In case of an initial site appraisal in a Member State without an existing EUPHEM site, the team leader or EUPHEM Chief Coordinator will inform the country officer of the upcoming visit and obtain information on the Member Sate and previous visits done by ECDC. These information and reports will be shared with the appraising team.

The potential site supervisor should provide the following:

- Number of outbreaks in previous 3 years
- Past projects in the area of public health microbiology relevant projects
- Potential initial projects
- Number and CVs of supervisors
- Organigram of the organisation

The appraising team will review the information that the potential site has shared with the team before the appraisal.

The team leader should share the latest version of the EUPHEM Scientific and Administrative manuals with the potential training site and prepare a general presentation on the EUPHEM programme.

Administrative steps

After reviewing the underlying documentation, the team leader contacts the potential site by email describing the objectives of the appraisal and proposing possible dates for the visit. In order to allow enough time for all administrative steps and allow a suitable preparation of the potential site, the date of the appraisal should be fixed at least six weeks in advance. The initial email should also include a plausible schedule including foreseen start and ending times. An example of this email is included in Appendix 1.

After fixing a date for the site appraisal, the team leader will invite a senior supervisor from the EUPHEM network to join the visit. The Programme Office is copied in all emails including the acceptance email from the person invited. The Programme Office will start the administrative procedure after receiving the acceptance email. ECDC will cover travel expenses, costs for accommodation and per diems according to the internal regulations for meetings.

During the site visit

The initial site appraisal serves to gain insight in the public health system (surveillance, communicable disease control, education) and the training opportunities in epidemiology of the specific country or region. Potential projects for the fellow should be discussed and potential supervisors identified. **The site appraisal should include a meeting with the main stakeholders in microbiology training of the country to present the objectives and methods of EUPHEM**. Also, all future possibilities of collaboration between the EUPHEM programme and the potential training site should be explored in detail.

One possible way to assess the suitability as a training site would be to perform a SWOT analysis, i.e. to identify the Strengths, Weaknesses, Opportunities and Threats for establishing a training site.

Site visit report

Before the end of the site appraisal, the visiting team prepares a short summary of all the findings of the visit. This summary can also be delivered using a template PowerPoint™ presentation which covers all relevant aspects of the appraisal.

The team leader prepares a detailed report using the template report (see Appendix 3) within 4 weeks after the visit. The report should provide a detailed assessment on whether the potential site is suitable to become a training site for EUPHEM or EUPHEM-associated training. If needed, the report should also provide concrete recommendations to improve the quality of the training at the potential training site. The team leader is responsible to follow up the implementation of the recommendations.

The draft report is shared with the other member(s) f the team and the other EUPHEM coordinators before sending it to the director/head of department/s and the potential supervisor(s) for comments. After having received the comments from the training site, the final report is sent to the potential training site for signatures. The training site should print and sign two (colour) copies of the final report. The EUPHEM Programme Office monitors the process of signing. One copy of the signed report will be kept in the EUPHEM archive and uploaded on the EUPHEM Virtual Office for future reference. The second copy will be sent to the institute for archiving.

In case the interested institute or organisation will become a training site, the future supervisors will be invited by EUPHEM/ECDC to **facilitate in the next EUPHEM introductory course.**

Follow-up site visits

Objective of follow-up site visits

Follow-up site visits of training sites who are currently hosting one or more fellows are planned to take place every two years. Ideally these visits should be planned neither too early nor too late in the training of the fellow. However, in case of the first fellow in a new training site, an early visit is warranted to recognise any potential problem in the training site at an early stage. Site visits can be executed more often than every two years, if needed. This could be the case in acute conflict situations between supervisors and fellows, or lack of progress in a fellow.

Objectives of these visits in this case are usually to review and discuss matters related to the EUPHEM training, such as

- Changes in the public health system since the last visit
- Environment including logistical and administrative aspects
- Supervision on site and at the programme office level
- Objectives and outcomes of the training of the fellow(s)

Visiting team

One EUPHEM coordinator and a representative from the EUPHEM Training Site Forum or a senior supervisor from one of the current training sites usually perform a follow-up site visit. Inviting supervisors from other sites to join the visit will provide them with an opportunity to compare the different sites and make improvements for the own site. Site visits are therefore regarded as "train-the-trainer" activities. In case that no supervisor is available two coordinators or one coordinator and one ECDC expert should perform the site visit. The EUPHEM coordinator is leading the team and is responsible for the final report.

During the site visit, the head of department, main supervisor, project supervisors and the fellow should all be present.

Preparation to a follow-up visit

For the follow-up visit, the team leader will share the report of the last visit with the training site and the supervisor joining the visit. The visiting team will read the last Incremental Progress Report and the Midterm Reviews of the fellow(s) before the start of the visit. The team will also review the documents uploaded on Extranet by the fellow(s).

Administrative steps

The EUPHEM coordinators contact the training site by email describing the objectives of the visit and proposing possible dates for the visit. In order to allow enough time for all administrative steps and allow a suitable preparation of the training site, the date of the visit should be fixed at least six weeks in advance. The initial email should also include a plausible schedule including foreseen start and ending times. An example of this email is included in Appendix 2.

Usually the site visit can be completed within two days. In case of more than one fellow at one training site, the site visit might be extended to more than two days.

After fixing a date for the site visit, the EUPHEM coordinators will invite a current or future supervisor from the EUPHEM network to join the visit. The Programme Office is copied in all emails including the acceptance email from the person invited. The Programme Office will start the administrative procedure after receiving the acceptance email. ECDC will cover travel expenses, costs for accommodation and per diems according to the internal regulations for meetings.

During the site visit

Essential elements of a follow-up visit should focus on the review of the fellow(s) related to the seven main training objectives. Changes within the public health system or the training site which are relevant for the training (ex. access to outbreak investigations, changes in supervision) should be discussed. The visiting team should look at administrative and logistical issues of the fellow(s), discuss the availability and type of supervision. The team should revisit with the supervisors and fellow(s) the projects done so far and identify which objectives still need to be reached. In order to have a better insight into the situation in the training site, the visiting team has separate meetings with supervisors and each fellow.
A follow-up visit should also be used as an opportunity to collect suggestions for the improvement of the communication between the EUPHEM coordinators and the supervisors.

Site visit report

Before the end of the site visit, the visiting team prepares a short summary of all the findings of the visit. This summary can also be delivered using a template PowerPoint™ presentation which covers all relevant aspects of the visit.

The team leader prepares a detailed report using the template report (see Appendix 3) within 4 weeks after the visit. The report should provide a detailed assessment of the activities and achievements of the fellow(s) and concrete recommendations to improve the quality of the training at the training site, if needed. The team leader is responsible to follow up the implementation of the recommendations.

The draft report is shared with the other member(s) f the team and the other EUPHEM coordinators before sending it to the host institute supervisor(s) and fellow(s) for comments. After having received the comments from the training site, the final report is sent to the training site for signatures. The training site should print and sign two (colour) copies of the final report. The EPIET/EUPHEM Programme Office monitors the process of signing. One copy of the signed report will be kept in the EUPHEM archive and uploaded on the EUPHEM Virtual Office for future reference. The second copy will be sent to the institute for archiving.

Appendix 1: Example for emails to start an initial site visit

Asking for material from new sites

Dear <names of potential supervisor and head of department>,
My name is <name of coordinator> and I am one of the EUPHEM Scientific Coordinators. We are very happy to hear the <name of institute> is applying to be an EUPHEM training site for the next cohort.

To take the application procedure forward, we would like to gain an idea on the potential supervision and activities in all training objectives for the potential fellow. Therefore, it would be very helpful if we had a description (in English) of the sites' resources and activities, especially those related to the training objectives of the fellows.

We also would like to ask for

- the number of people working in the unit
- job profiles and CVs of potential supervisor(s)
- an organization chart of the unit
- international project(s) you are involved in
- training programme(s) you are involved in
- a list of all publications of the last 5 years.

We will come back to you regarding an initial site appraisal after the review of this material.

<Greetings, name>

Copies to all EUPHEM coordinators, EUPHEM programme office

Asking for a date of the site appraisal

Dear <names of potential supervisor and head of department>,

Thank you for sending us the information on the <name of institute>. We have reviewed the information and would now like to perform a site appraisal. The objective of the appraisal is to gain an idea on the potential supervision and the opportunities for future fellows to be involved in outbreak investigations, surveillance activities and research projects.

We would like to meet all those responsible for the training in field epidemiology, including the head of department in <name of institute/country>. We can use this opportunity to present the main characteristics of the EUPHEM programme. We would also like to visit the premises and discuss potential logistical issues of a fellowship with you.

At the end of the day, we would provide a preliminary summary of the findings in a plenary meeting. We will discuss the impression of the site appraisal, and look at elements that deserve attention in order to become an EUPHEM training site. Of course, the schedule of the site visit is flexible and can be arranged differently, should this be necessary for practical reasons.

Most probably for the site in <name site> could be done in one day (most likely arriving the evening before).We would like to schedule this site appraisal in <month>. When would be a suitable date for you? We would propose: - date 1, - date 2, - date 3

For the appraising team, it will be myself and another EUPHEM supervisor (to be confirmed). Please let me know as soon as possible if any of these dates would be convenient. We look forward to hearing from you. If you have any questions or suggestions, please do not hesitate to contact us.

<Greetings, name>

Copies to all EUPHEM coordinators, EUPHEM programme office

Appendix 2: Example for initial email to training site

Dear <names of supervisors and fellows>,

As you may know, we perform a site visit to EUPHEM host institutes at least once every two years. The last site appraisal in <name of city> was in <year month>. By <month>, <name of fellow> has been in <name of host institute> for some months and it would be good to perform a site visit.

The objectives of the site visit would be to review and discuss matters related to the EUPHEM training, such as

- environment including logistical and administrative aspects;
- supervision on site and at the programme office level;
- objectives and outcomes of the training of <name fellow>.

During the site visit, we usually start off with a plenary meeting, where those responsible for the training present the organisation and where EUPHEM can present the programme and latest developments. It is useful that director or deputy director, all microbiology departments and epidemiology department are invited to the plenary session and information regarding programme will be given to all participants. After plenary session all departments are given possibility to present their activities and the visiting team then will visit the laboratories. After a short preparation of 30 minutes, the visiting team provides a preliminary summary of the findings in a plenary meeting. We will discuss the impression of the site visit, and we look at elements that deserve attention in the next stage of the training on either the side of the fellow, the supervisors, the training site or of the EUPHEM programme office. Of course, the schedule of the site visit is flexible and can be arranged differently, should this be necessary for practical reasons.

Most probably for the site in <name site> could be done in one day (most likely arriving the evening before).

When would be a suitable date for you? We would propose:
- date 1
- date 2
- date 3

For the visiting team, it will be myself and another EUPHEM supervisor (to be confirmed). Please let me know as soon as possible if any of these dates would be convenient. We look forward to hearing from you.
<Greetings, name>

Copies to all EUPHEM coordinators, EUPHEM programme office

Appendix 3: Site appraisal report template

EUROPEAN PUBLIC HEALTH MICROBIOLOGY (EUPHEM) TRAINING PROGRAMME

SITE APPRAISAL REPORT

Name of site

City

Country

Date

Training Site Appraisal

Host Institute:
Institute Head:
Training Department Head:
Department:

EUPHEM Fellow:
Date of Joining:
EUPHEM Training Supervisor:

Visiting appraisal team:

1 name function
2 name function

Signed:

Name team leader	**Name second visiting person**
Name main supervisor	**Name additional supervisor**
Name fellow	

Persons met:

Names of all persons met

The objectives of the training site appraisal were:

-

1/ Administrative and logistical issues:

Public Health system:

Changes in public health system of host country since last visit

Office space:

Office space for fellow, access to library, laptop, software etc

Logistical issues:

Salary, removal, accommodation, language etc

2/ Host institute supervision:

Supervision:

Main supervisor, other supervisors, supervision structure and quality, impression of fellow on supervision

Fellow:

Impression of supervisors on fellow (attitude, progress, integration in department)

Induction:

Presence of induction programme

3/ Training objectives:

Name of fellow

Public Health Microbiology Mannagement:

Short overview of activities of the fellow in this field

Public Health Microbiology laboratory investigations:

Short overview of activities of the fellow in this field

Epidemiological investigations:

Surveillance:
Outbreak investigation:

Short overview of activities of the fellow in this field

Biosafty/biosecurity and quality mannagement:

Short overview of activities of the fellow in this field

Research:

Short overview of activities of the fellow in this field

Communication:

Short overview of activities of the fellow in this field

Teaching activities:

Short overview of activities of the fellow in this field

Others

Other relevant activities not directly related to the training objectives

4/ EUPHEM training programme co-ordination:

Feedback to the coordinators. Discuss how to share early drafts.

Summary and recommendations:

1/ Administrative and logistical issues:

2/ Supervision:

3/ Training objectives:

4/ International assignments:

5/ EUPHEM coordinators