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1. Background

The European Centre for Disease Prevention and Control (ECDC) was established in May 2005. Its mandate, defined in April 2004 by the regulation 851/2004 of the European Parliament and of the Council, includes strengthening the capacity for response to health threats in the EU.

In December 2005, a consultation with the Member States (MS) was held to agree on an ECDC Training Strategy for the period 2006-2010. Among the conclusions of that meeting, the development of core competencies for epidemiologists working in public health was considered a high priority. Therefore, after its presentation to the Advisory Forum, it was agreed to start the process by reviewing the literature and experiences in different countries, as well as in competencies in public health.

The emphasis is put on the "workforce" vs. "instructional" competencies, as a stepwise process, that starts from the professional competencies in order to use them later in training and curricula development, adjusted to specific needs. The list of core competencies in epidemiology for public health administrations of the EU is intended to increase the comparability of job descriptions and activities in this area.

Nevertheless, special consideration is given to the knowledge and skills acquired by the epidemiologists graduated from the Field Epidemiology Training Programmes (FETP), including the Epidemiology Programme in Intervention Epidemiology (EPIET). Epidemiologists enrolled in these programmes have a similar exposure to the "learning by doing" methodology, being supervised by senior epidemiologists in their practice of epidemiology, and participating in theoretical courses to strengthen their knowledge and skills. Currently, these programmes are recognized for their development of "competence-based"[1] curricula.

The ECDC has developed a draft list of suggested core competencies for intervention epidemiologists working at the Public Health Institutes at the national and regional level in the European Union. The list was peer-reviewed by experts at ECDC, EPIET and the EPIET Alumni Network (EAN). These core competencies should be discussed by experts in public health epidemiology and periodically reviewed and updated as practice and knowledge evolves.

In order to review this list and discuss further steps, an expert meeting was held in Stockholm on 31st January 2007, with the valuable input of the FETPs, and organizations, as the Association of Schools of Public Health in the European Region (ASPHER), the Training Programmes in Epidemiology and Public Health Intervention Network (TEPHINET) and the EAN, among others.

The results and conclusions of this expert meeting are summarized in the present report. Due to the specific characteristics of this process, it is necessary to agree on the terminology of reference. A glossary of terms can be found in appendix 1.

In May 2007, the revised list will be discussed and scored in a consultation with the MS. Once finalized, the list of core competencies will be presented to the ECDC Advisory Forum (AF), and later published.

2. Purpose and objectives of the meeting

The purpose of this activity is to identify the minimum set of abilities that every field epidemiologist should have, defined by core competencies in various domains. Optional competencies needed for specific functions or job descriptions will be addressed in the future.

The objectives of this expert meeting were:

Objective 1: To present the perspective of different users and agree on the scope of the activity.

> **Expected output**: An understanding of the usefulness of the process and agreement about the scope or professional target

Objective 2: To discuss the main tasks of a public health epidemiologist in CDSR

> **Expected output**: A list of tasks that are common to different job descriptions for epidemiologists in CDSR in the EU

Objective 3: To translate tasks into domains and core competencies

> **Expected output**: A draft list of core competencies for a public health epidemiologist in CDSR in the European Union

3. Participants and methodology

Eighteen epidemiologists and public health officers from different institutions, including Public Health Agencies and Institutes as well as Training programmes, associations (EPIET, EAN, EUPHA, French FETP, German FETP, HPA/UK, Indian FETP, Italian FETP, PH School of Debrecen, RIVM/The Netherlands, TEPHINET Euro and US CDC) and the World Health Organization participated in this meeting.

Some of the experts contributed with presentations on the subject and others supported the activity chairing and moderating sessions and working group activities. ECDC staff also participated in the consultation (see Annex 3: participant list).

The activity consisted of expert presentations and working group activities for brainstorming and discussion.

4. Objective 1: Usefulness and scope

The meeting started with presentations of the experts about different perspectives, according to the users and uses of the core competencies. First users may be, not only the Institutes of Public Health in the MS and other levels of the administration (intermediate, local), that are the traditional employers of these professionals, but also employees2.

Employers can use them to develop job descriptions and terms of reference, to facilitate the planning of the professional development of epidemiologists in the organization, to develop training plans for employees, to assess epidemiologic capacity of the organization and to evaluate performance.

For epidemiologists, as employees, the core competencies can help them in the assessment of their current skills, to orient their career and to plan specific training (life-long learning).

Both, trainers and trainees can use them as an assessment tool.

4.1.Expert presentations from the users perspective

4.1. 1. Competencies in Public Health

Dr Zoltán Vokó, from the Faculty of Public Health, in the University of Debrecen, Hungary, presented some international examples of the process of defining competencies in public health, particularly the experience of ASPHER to develop the competencies for the European Master in Public Health and the Masters in Public Health in Hungary.

The Masters in Public Health is a two-year programme to be launched in 2007, in accordance with the Bologna process, which include general core competencies, professional core competencies and stream specific competencies (for example, in epidemiology).

It was emphasized the importance of putting competences in epidemiology in the broader framework of public health and to build new developments on previous experiences and results from the work of many years and extensive consultation

4.1. 2. The US CDC experience on development of applied epidemiology competencies

Dr Denise Koo presented the experience of The U.S. Centers for Disease Control and Prevention (CDC) and Council of State and Territorial Epidemiologists (CSTE) on the development of Applied Epidemiology Competencies for Governmental Public Health Agencies to improve the practice of epidemiology within the public health system.

To define the discipline and describe expected competencies for applied epidemiologists, CDC and CSTE convened an expert panel with crosscutting representation that examined and refined existing relevant competencies.

The panel developed epidemiologic and non-epidemiologic competencies for applied epidemiologists. These competencies were further validated by two online surveys, the first during summer 2005. After reviewing results from the initial survey, the panel developed workforce and instructional competencies for four tiers of applied epidemiologists. These competencies were validated in early 2006 by a second online survey. Respondents represented the full range of self-identified tiers and domains of practice and were highly supportive of the competencies.

The CDC/CSTE competencies comprise valid representations of competencies needed for the public health practice of epidemiology in the United States.

The latest version[2] of these competencies was published online in October 2006.

4.1. 3. Competencies as a tool for employers

A critical approach was taken by Dr Ruth Gelletlie, from EUPHA, who introduced her presentation raising the need that organisations have to deliver their goals within budget to succeed, while keeping public confidence. Competencies can contribute to organisational success by defining functional roles, job descriptions and remuneration, supporting workforce development and retention, and assisting in quality assurance.

However, ultimately success is judged by actual achievement of programme outcomes rather than the competency of the staff.

Also, competencies are very difficult and time-consuming to define, and challenging to measure, while individual characteristics such as drive and integrity are not suited to the competency approach. So, competencies can contribute to the success of public health organisations, but they are not the whole answer.

4.1. 4. Guiding the learning process, the supportive supervision tool

Dr Yvan Hutin, resident advisor of the Indian FETP, presented the development of a supervision tool for trainees in dialogue with the supervisor, a method that can be used also between employers and employees in career development processes.

This instrument was presented as a “quality assurance” tool.

An important message was that the choice of core competencies is very relevant. They should be: focused (not necessary getting into details), measurable using standardized methods, specific and linked to deliverables. Their formulation should be done using action terms.

Also, other programmes have developed skills assessment tools. They are “live” instruments: the EPIET, for example has just adapted its 10-year old tool to the new reality of core and optional courses.

4.2. Scope or professional target of this activity

Discussion covered the scope of the competencies: it was agreed that public health is the framework for the professional target of this activity. The experts discussed in particular whether they should focus on epidemiology for communicable diseases only or include non communicable diseases.

The group agreed on the priority to develop core competencies for *epidemiologists working in public health administrations in the area of communicable disease surveillance and response (CDSR*). *Field epidemiologist* and *intervention epidemiologist* are used in the text as synonyms of the same concept.

5. Objective 2: Tasks of an intervention epidemiologist in the public health administration

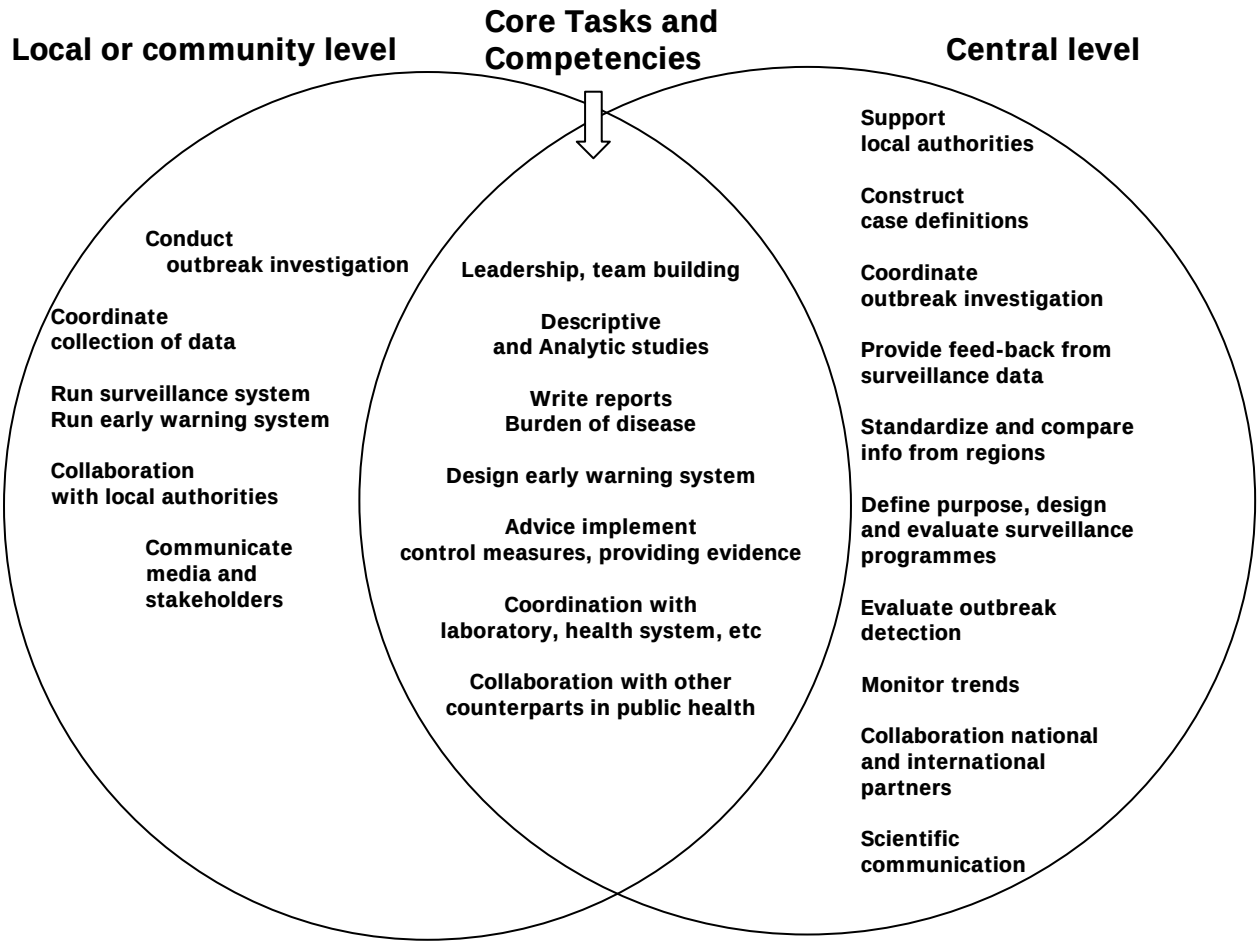
The experts worked in two parallel working groups, in the local and central level respectively, to define the tasks of an epidemiologist in charge of the areas of detection, surveillance, prevention and control of health threats in different contexts of the public health administration.

The objective of this exercise was to identify and phrase the main tasks that should be conducted by these professionals, to discuss later in a plenary session the competencies that would be common to both. The main goal of this activity was to find the “core competencies”, regardless of the context.

The scope of the job description was defined at the beginning, making it broader than infectious diseases, but focusing in acute threats.

After finding important differences between the local and the central levels, the possibility of separating them and construct two lists was discussed. Nevertheless, the fact that the “core competencies” are the intersection or minimum requisite implies that there should be only one list. This may be discussed further in the next review. Examples of tasks that the groups presented as characteristic of these levels, as well as those that are common to both (core competencies) are reflected in Figure 1. This is the result of a brainstorming exercise in the group and it cannot be considered a validated model.

Figure 1- Tasks of epidemiologists in CDSR in the public health administration



There are competencies in some cross-cutting areas, like infectious disease epidemiology, informatics and language skills that were highlighted by the participants as a requisite to perform the job efficiently.

6. Objective 3: Consensus on domains and competencies in intervention epidemiology in CDSR

The experts worked in two parallel groups to discuss a draft list of core competencies. This exercise consisted on a review, evaluation of completeness and categorization of them in "C" for core, "S" for those that are specific to the defined terms of reference of a job post or "I" for irrelevant.

The US CDC expert provided the group with a summary of their documents for different tiers: entry-level, middle-level, senior level epidemiologist (supervisor-manager or subject area expert).

The main conclusions of this exercise were:

- Most of the reviewed competencies were evaluated as core.
- Competencies are different according to levels: at the central PH services, there is more need for coordination and less field activities. Managerial skills are often necessary in the community and intermediate level.

Regarding the creation of a second draft list of core competencies, the expert group recommended:

- To ensure that the sequence of competencies is written following a logical order;
- To verify the classification and the hierarchy of concepts in phrased domains, competencies and sub-competencies;
- To use simple verbs and avoid composed one. It is suggested to avoid the use of the verb "to be able to", which may be repetitive, and assume that it introduces implicitly all the competency statements;
- To avoid too many levels of detail to facilitate the use of the document. Prepare a document of 2 or 3 pages at the generic competency level and leave sub-competencies for next phases. For example, to develop curricula in training courses, it may be necessary to disaggregate the sub-competencies and even the sub-sub-competencies, linking them with learning objectives;
- To account for difference of competencies according to level of expertise in the profession. It was agreed to keep the focus in the mid-entry level, that could be defined as a professional with some postgraduate degree and/or experience of three years approximately in public health epidemiology;
- To review classification of domains into large areas, such as general, interpersonal or behavioural and specific for epidemiology

7. Discussion and next steps

The final purpose and objectives of the development of core competencies and the potential users were discussed at the end of the meeting.

Participants highlighted that it is convenient to link this process with the assessment of capacity and needs in epidemiology, as it may be a useful tool for assessing the expertise of human resources and the training needs.

Accreditation and certification issues were mentioned and in the medium-long term it may be necessary to consider the need of using the developed competencies as a reference to initiate the procedures for those goals. The importance of understanding the new European Credit Transfer System (ECTS) in the context of the European Higher Education Area was highlighted. The Italian FETP has initiated the process for acquiring these credits, probably facilitating the certification of the programme in the medium term.

The World Health Organization presented briefly their activities in workforce development. The department of Knowledge Management is conducting a mapping of Public Health resources, especially relevant in the context of the Implementation of the International Health Regulations. The world federation of PH Schools associations is closely collaborating in this enterprise.

Other experiences were discussed briefly, like the development of core competencies in Public Health in Poland, project that has received a prize as a model of good practice by the EU.

On the basis of this meeting, ECDC will prepare a list of competencies in public health epidemiology.

7.1. Expert team review

The experts offered their collaboration for the next round of review, to be conducted in February and March 2007 until the next draft list of competencies is consolidated.

The experts suggested identifying additional reviewers for this phase, for example members of the ECDC Advisory Forum, before making a more open review.

7.2. Online review

Subsequently, the following phase should involve an important number of experts and institutions.

Regarding the methodology, based on the US experience, the complexity of the editing process is recognized and an online review is recommended. This will also allow involving the public and collecting volunteer observations from all the levels of practice.

7.3. Consultation with focal points on training in MS

The last draft will be presented to the focal points on training in the Member States during the next consultation on the ECDC Training Strategy, to be held in June 2007.

7.4. Presentation to the ECDC Advisory Forum

Once the draft is finalized, it will be presented to the ECDC Advisory Forum in September 2007.

8. References

1. FETP Competencies August 2005 (http://www.cdc.gov/descd/materials.html#Curriculm)
2. CDC/CSTE: Applied Epidemiology Competencies for Governmental Public Health Agencies, June 2006 (www.cste.org)
3. ASPH Education Committee, Master´s Degree in Public Health Core Competency Development Project. Version 2.3. October 2004- August 2006 (http://www.asph.org/userfiles/Version2.3.pdf)
4. UK Public Health competencies (Public Health Training Portfolio) http://www.fph.org.uk/training/higher_specialist_training_programme/training_portfolio.asp
5. UK competencies for Training in health protection http://www.fph.org.uk/policy_communication/downloads/publications/training_in_health_protection.pdf
6. Epi competency set. Northwest Centre for Public Health Practice Washington University http://www.nwcphp.org/epi/competencies
7. ASPHER; the European Master of Public Health. Vademecum. Part 5: Catalogue of Potential Competencies. http://www.aspher.org/C_projects/EMPH/EMPH%20Vademecum.pdf
8. Indian Field Epidemiology Training Programme. Assessment Tool. Yvan Hutin, Resident Advisor

Appendix 1 - Glossary

Public Health

…Science and art of preventing disease, prolonging life, and promoting health through organized community efforts. These include sanitation, control of contagious infections, hygiene education, early diagnosis and preventive treatment, and adequate living standards. It requires understanding not only of epidemiology, nutrition, and antiseptic practices but also of social science.

Encyclopaedia Britannica

The New Public Health includes all possible activities known to be useful and effective in promoting health and in the prevention, treatment, and rehabilitation of diseases for the individual, the community, and the population as a whole.

Institute of Medicine, Committee for the Study of the Future of Public Health, Division of Health Care Services (1988), The Future of Public Health. Washington DC National Academy Press (http://www.phdatastandards.info/knowresources/tutorials/glossary.htm#text99)

Public Health Officer

Public health professionals work in many settings, around the five core disciplines of public health: Biostatistics, Epidemiology, Environmental Health Science, Health Policy and Management and Social and Behavioural Sciences. Knowledge and skills in these disciplines equip them to analyze and consider solutions to public health problems at the community, institutional and societal levels.

US Association of Schools of Public Health (ASPH) Education Committee, Master's Degree in Public Health Core Competency Development Project

Epidemiology

The study of the distribution and determinants of health-related states and events in specific populations, and the application of this study to control health problems

Last JM, A dictionary of Epidemiology, 4th edition, New York: Oxford University Press, 2001:62

It is a fundamental science of public health

Harvard School of Public Health (http://www.hsph.harvard.edu/epidemiology/)

Field epidemiology

"The practice or application of epidemiology to control and prevent health problems"

(http://www.cdc.gov/excite/classroom/intro_epi.htm#more)

"The constellation of problems faced by epidemiologists who are called upon to investigate urgent public health problems..."

Field Epidemiology, 2nd edition Michael B. Gregg, editor. Oxford University Press, Oxford, England, 2002, ISBN 0-19-514259-4

Field epidemiologist

With no agreed definition of field epidemiologist, the ECDC suggests the following:

"The epidemiologist that applies the science of epidemiology to the prevention and control of public health problems and works in intervention and response activities"

Competency

"Combination of knowledge, skills and abilities that a professional must demonstrate and are critical to perform work effectively"

Any competency statement should consist of the following elements:

- action verb (observable or measurable performance of a worker)
- content (subject matter, type of performance, specific task)
- context (limitations or conditions of work environment)

Domain

Groups of competencies, organized according to a specific area of knowledge or skills involved

Skills

Ability, proficiency, facility, or dexterity that is acquired or developed through training or experience

Knowledge

Familiarity, awareness, or understanding gained through experience or study

Curriculum

Set of courses and their contents offered by an institution, such as a school or university as part of a training programme

Appendix 2: Participant list

Nancy Binkin	Italy	Italian FETP
Denise Koo	United States	US CDC
Katharina Alpers	Germany	German FETP
Luca Busani	Italy	TEPHINET EURO
Ruth Gelletlie	United Kingdom	EUPHA
Marta Valenciano	Spain	EPIET coordinator
James Stuart	United Kingdom	HPA, UK
Alena Petrakova	Switzerland	WHO
Preben Aavitsland	Norway	PH Institute
Katarzyna Czabanowska	Poland	PH Institute
Brigitte Helynck	France	French FETP
Jeanette de Boer	The Netherlands	IRVM
Lara Payne	Stockholm	EAN
Yvan Hutin	India	India FETP
Zoltán Vokó	Hungary	PH School of Debrecen
Arnold Bosman	Stockholm	ECDC, EPIET head coordinator
Carmen Varela	Stockholm	ECDC, Senior expert PRU
Denis Coulombier	Stockholm	ECDC, Head Unit PRU

Appendix 3: Programme of the expert meeting

09:00 – 09:30	**Opening,** Denis Coulombier
09:15 – 09:30	**Presentation of activity,** Carmen Varela
09:30 – 10:00	**Competencies in Public Health, pre-requisite for field epidemiologists** Zoltán Vokó, Public Health School Debrecen
10:00 – 10:30	**Experience of US CDC/CSTE in development of competencies in applied epidemiology** Denise Koo, US CDC
10:30 – 11:00	Coffee break
11:00 – 11: 15	**Competencies as a tool for employers** EUPHA, Ruth Gelletlie
11:15-11:30	**Competencies as a self-assessment tool for trainees** MAE India, Yvan Hutin
11:30-13:00	**2 Working groups: Tasks of an intervention epidemiologist** Group A. Moderator: Arnold Bosman; Rapporteur: Preben Aavistland Group B. Moderator: Marta Valenciano; Rapporteur: Carmen Varela
13:00 – 14:00	Lunch
14:00 – 15:30	**2 Working groups: Consensus on Domains and Core competencies.** Group A. Moderator: Arnold Bosman; Rapporteur: Preben Aavistland Group B. Moderator: Marta Valenciano; Rapporteur: Carmen Varela
15:30 – 16:00	Coffee break
16:00 – 16:30	**Feedback from the groups**
16:30 – 17:00	**Discussion & Next steps**