

Defining core competencies for epidemiologists working in communicable disease surveillance and response in the public health administrations of the European Union

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Strengthening the capacity to combat infectious diseases in the European Union (EU) is a core function of the European Centre for Disease Prevention and Control (ECDC), clearly expressed in its mandate [1].

Two main elements are critical for building and strengthening epidemiological capacity:
(1) Infrastructure - resources in terms of budget, facilities, equipment, etc. of national public health administrations.
(2) Human resources - sufficient numbers of trained and/or experienced professionals.

To fill the gaps in professional performance, it is necessary to define the tasks and skills required of field epidemiologists. The development of such a list of core competencies was highlighted as a priority among the conclusions of the first ECDC consultation with EU Member States on training in field epidemiology, in December 2005 [2].

The ECDC, along with a group of experts, has developed a list of suggested core competencies for field epidemiologists working in public health institutions in the European Union, at all levels, from sub-national (provinces, districts, regions) to national and supra-national (European and international). An agreed definition of the term "field epidemiologist" is not available, but the group of experts has proposed one for the purpose of this activity (Table 1) [3].

TABLE 1**Glossary of terms**

Field epidemiologist
"An epidemiologist who applies the science of epidemiology to the prevention and control of public health problems and works in intervention and response activities"
Competency
"The combination of knowledge, skills and abilities that a professional must demonstrate and that 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

Core**competencies**

A competency is a *combination of knowledge, skills and abilities that a professional must demonstrate and that are critical to perform work effectively.*

Core competencies are defined first for middle-level professionals, as opposed to junior or senior epidemiologists. Despite the risk of creating artificial categories in the career development ladder, this approach has been taken to facilitate the process. At a later phase, the competencies can be developed for other career stages.

The term "core" indicates that the competencies should be a minimum pre-requisite for any field epidemiologist, regardless of the level he/she occupies in the public health administration. They should be common to all professionals in this field.

Use of the list of core competencies
 We believe that the list may have several users:
 - Employers, such as public health institutes and administrative bodies at all levels in the EU, who may use the list to assess their epidemiological capacities and needs.
 - Epidemiologists themselves who may use the list for planning and evaluating their own career development (Table 2).

TABLE 2**Use of the list of “workforce” core competencies**

Employers
Develop job descriptions
Plan career development cycle of the professionals in the organization
Assess the epidemiologic capacity of the organization in order to shape it according to needs
Evaluate individual performance
Plan training for employees
Epidemiologists
Self-assessment
Plan career development
Plan learning activities according to individual needs

In addition, teachers and facilitators can use the list to design strategies and programmes to train future generations of epidemiologists in order to meet the needs of public health agencies.

Among the competencies, one can distinguish “workforce” competencies, as opposed to “instructional” ones, depending on the perspective taken for their development: i.e. employers or trainers views, respectively.

According to the MACH model (the acronym is made up of the initials of the authors’ surnames [4]), both approaches are complementary and can be part of a more complex cycle, where the primary outcome is organizational performance. In this model, the contribution of employees is defined by the workforce competencies or tasks; from these, the instructional competencies are developed in order to conduct needs assessments and planning of relevant training. The training and the personal skills influence the individual performance, which in turn affect the organizational performance thus closing the cycle [4].

Furthermore, we hope that publishing and promoting this list of core competencies in the EU’s public health system can help to:

- agree on a definition of “field epidemiologist” and achieve the recognition of the profession;
- allow Member States to assess their resources and define their needs;
- set priorities by teachers and curriculum developers; and
- increase the comparability of field epidemiology training programmes, which could facilitate mobility in the EU through accreditation initiatives.

Further**development**

We want to encourage a discussion of this list of core competencies by experts in the field. We also plan to review and update the list at regular intervals, as public health practice and knowledge evolves.

In July 2007, an online survey was launched on the ECDC website (<http://www.ecdc.europa.eu>). It seeks to score a list of 85 competencies that belong to 26 domains in eight areas (Table 3), through a Likert scale (1 to 5). The aim is to see whether there is a general agreement as to the core competencies and to collect, comments about the domains and areas included. The survey is anonymous but the participation of epidemiologists from different public health administrations of all EU Member States is especially welcome. To

take part, please visit: http://www.ecdc.europa.eu/online_survey.html. The survey is open until 31 August 2007.

TABLE 3

Suggested ECDC classification of areas and domains in public health epidemiology

Category	Area	Domain
Specific for the profession	Public health	1. Public health science 2. Public health policy 3. Risk assessment 4. Public health surveillance 5. Outbreak investigation 6. Epidemiological studies 7. Laboratory issues 8. Public health guidance
	Applied epidemiology	9. Probability 10. Inferential statistics 11. Sampling 12. Mathematical modelling 13. Internet 14. Statistical and other data analysis 15. Editing and presentations 16. Risk communication 17. Written communication 18. Oral communication 19. Use of new technologies 20. Planning and use of resources 21. Team building and negotiation 22. Mentorship 23. Training 24. Protection of individuals 25. Confidentiality 26. Conflicts of interests
Common to other professions	Biostatistics	
	Applied informatics	
	Communication	
	Management	
	Capacity development	
	Ethics	

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References:

1. Regulation (EC) No 851/2004 of the Parliament and of the Council, establishing a European Centre for Disease Prevention and Control. Available from: http://www.ecdc.europa.eu/About_us/Key_Documents/ecdc_regulations.pdf
2. Meeting Report: Consultation with the MS about an ECDC Training Strategy, Dec 2005. Available from: <http://ecdc.europa.eu/Activities/Training.html>
3. Meeting Report: Core competencies of epidemiology in the area of communicable disease surveillance and response in the EU, 1st ECDC expert meeting, Stockholm, 31 January 2007. Available from: <http://ecdc.europa.eu/Activities/Training.html>
4. Miner K, Childers W, Alperin M, Cioffi J, Hunt N; The MACH Model: From Competencies to Instruction and Performance of the Public Health Workforce, Public Health Reports 2005 SUPPLEMENT 1 / Volume 120. Available from: http://www.publichealthreports.org/userfiles/120_SUP1/120009sup.pdf

