The Association of Schools of Public Health in the European Region

Recommendations for PhD programmes in public health

A report from the ASPHER Working Group on Doctoral Programmes and Research Capacities

May 2013

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Executive summary

Background: This document is produced by a working group representing several ASPHER (Association of Schools of Public Health in the European Region) member schools. The group's main aim was to help public health schools by formulating practical guidelines for setting up PhD programmes. These guidelines are a set of minimal common criteria among the public health doctoral programs. They integrate most aspects of the recently published ORPHEUS (Organisation for PhD Education in Biomedicine and Health Sciences in the European System) report centred on the harmonization of doctoral training in medicine, with specific amendments unique for public health. Other aims are to encourage cooperation among ASPHER members, mobility of doctoral candidates and academic staff throughout Europe, to set up common criteria allowing doctoral students to participate in the doctoral programmes of several schools, to stimulate quality assurance for doctoral research and education, to promote the development of joint doctoral programmes and the overall harmonisation of doctoral programmes in public health, and to participate in the development of an accreditation process for doctoral programmes in public health.

Recommendations: (1) Admission criteria: Enrolment is the responsibility of the university and the relevant academic unit. However, ASPHER recommends general principles concerning the process, documentation, interviews, candidate criteria, and quality assurance. (2) Relation to other disciplines: Because of the variety of background of PhD candidates, specific upgrading of students from different disciplines may be necessary and interdisciplinary collaboration is advisable. (3) Studies: The typical programme should be time limited (3-5 years, including six months, 30 ECTS of formal courses) with realistic goals. Students graduate as qualified professionals and independent researchers with close ties to policy makers and academic familiarity. Mobility between PhD programmes should be promoted and a quality assurance framework developed. (4) Supervision: Supervisors should be pre-selected, well-qualified, tenured faculty members, who outline clear expectations. They should be formally trained, present throughout the programme, and guide the student's timetable, training and career development. The number of doctoral students per supervisor should be compatible with his or her workload. (5) Theses: The thesis shows the student has acquired the relevant knowledge and skills. Students should submit a cumulative thesis based on at least three published papers (Preferably, the student should be the first author, or senior author, on at least two of the papers presented for a cumulative thesis). (6) Examination Process: Responsible institutions dictate the terms of a fair and timely thesis evaluation, as well as appointing the assessment committee. Clear criteria for theses assessment have to be applied. The thesis must be orally defended in front of an audience comprised of the assessment committee, other professionals and laymen.

Conclusion and Next Steps: ASPHER could organize PhD supervisor workshops. Such workshops could evolve into more organised forms of collaborations, e.g., to courses for supervisors. Other areas for development include opportunities to develop a professional DrPH, a formal process of quality assurance and more exchanges between PhD programmes and students in public health.

Preamble

1. For the past five years, several ASPHER member schools have exchanged information on the "third cycle" in public health education, i.e., doctoral studies in public health. More recently, they have begun to think about common criteria for the doctoral degree and coordination with programmes in other disciplines. Concurrently, the group explored ways to promote research capacities in public health through doctoral programmes.
2. During the ASPHER yearly meeting in Lodz (November 2009), it was decided that the doctoral programme group, launched by Ursula Ackermann-Liebrich, should be formalized as an ASPHER board working group. It was established under the name "Doctoral Programmes and Research Capacities", and co-chaired by Ursula Schlipköter and Fred Paccaud. Ursula Schlipköter has since been replaced by Jacqueline Müller-Nordhorn.
3. The main aim of this working group and more specifically, of this report, is to help the schools of public health currently implementing and developing doctoral programmes by formulating practical guidelines. The guidelines are a framework for collaboration and a set of minimal common criteria among the public health doctoral programs.
4. Further aims include:
    (i) to encourage cooperation among ASPHER members, with the development of effective bilateral and/or multilateral networks;
    (ii) to encourage the mobility of doctoral candidates and academic staff throughout Europe;
    (iii) to set up common criteria allowing doctoral students to participate in the doctoral programmes of several schools, thereby assisting schools with limited capacity in some areas relevant for specific doctoral programmes;
    (iv) to stimulate quality assurance for doctoral research and education;
    (v) to promote the development of joint doctoral programmes and the overall harmonisation of doctoral programmes in public health;
    (vi) to participate in the development of an accreditation process for doctoral programmes in public health.[a]
5. Concurrently, medical faculties of several European universities started the harmonization of doctoral training in medicine within the framework of ORPHEUS (Organisation for PhD Education in Biomedicine and Health Sciences in the European System), an association of European biomedical and health science faculties and institutions.[b]

[a] See the agenda of the Agency for Public Health Education Accreditation (APHEA) set up as a joint initiative of the EUPHA and the ASPHER

[b] http://www.orpheus-med.org/index.php?lang=en

6. In 2009, the ORPHEUS members (Aarhus Meeting) put forth a position paper called *"Towards Standards for PhD Education in Biomedicine and Health Sciences"*. [a] Large parts of the current ASPHER document are directly inspired by this 2009 position paper.
7. The ORPHEUS position paper was amended during their next meeting in Vienna (2010), then again in Izmir (2011) and in Bergen (2012).
8. The present ASPHER document integrates most aspects of the ORPHEUS work, with specific amendments unique for public health. It takes a very practical approach, systematically addressing specific issues related to launching a PhD programme, or assessing its formal quality.
9. The document contains several gaps. For example, issues related to funding have not been considered. Further, the link between doctoral studies and post-doctoral positions must be formalized. Finally, the implementation strategy for the recommendations has yet to be defined.
10. The working group (see list of participants, p.21) elaborated upon and discussed the document in depth during a meeting held in Zurich (September 2012). A revised version was circulated among the working group members and discussed again during the ASPHER assembly in Malta (November 2012). It was finally adopted during an Executive Board held in Brussels (March 2013).

Defining the terms

11. It is important to note here a statement made by the European Higher Education Area: *"The core component of the third cycle is the advancement of knowledge through original research, and this makes the third cycle unique and different from the first and second cycles. The doctoral training phase constitutes the main link between the European Higher Education and Research Areas, and high quality doctoral programmes are therefore crucial in achieving Europe's research goals".* [b]
12. The above statement clearly puts emphasis on the research aspect of a PhD thesis and positions it as an element of an academic career. This is a common understanding of a PhD in most disciplines. In this perspective, the general rules and formal requirements developed by ORPHEUS apply to public health.
13. For clarification purposes, a few definitions are given below.
14. Research is a "*systematic activity in which wondering, a critical, prepared mind, and creativity unite in a search for skills, knowledge, and understanding about what has happened, what people think, the laws or theorems that govern things, how things are caused or work, or how findings can be translated into outcomes of practical use, in which verification/falsification, innovation, hypothesis testing, and problem solving play key roles, and which includes creative reflection, enquiry, observation, or experimentation involving manipulation of natural, cultural, or social phenomena, linked to evaluation and interpretation*". [c]

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[a] http://www.orpheus2009.org/upload/orpheus/final%20version%20(3)%20(3).doc

[b] Bologna Seminar on Doctoral Programmes for the European Knowledge Society, see http://www.eua.be/eua/jsp/en/upload/Salzburg_Conclusions.1108990538850.pdf

[c] From the list of the glossary of terms that the MEDINE 2 group, coordinated by Chris van Schravendijk (version April 2012). See http://medine2.com/Public/package_07b.html

15. Public health research aims to produce knowledge as described on §14. However, public health uses a population perspective to identify health needs, determinants of these population needs, and the appropriate responses to these needs. For reference, medical research is research of any kind that is relevant to human health or ill health, symptomatic or asymptomatic.[a] Therefore, the population perspective is specific to public health.

16. A PhD thesis is the scientific document summarizing a student's achievements, skills and knowledge obtained during his/her doctoral programme. Further, the thesis "*is research-based. The research is not undertaken as an objective in itself, but rather as a means in most cases of testing the validity of a hypothesis*". [b] See also the Glossary for an annotated definitions of a PhD (§101, p.19) and a PhD thesis (§98, p.18).

17. This paper addresses the issues specifically related to the PhD in public health, i.e., doctoral work concerned mainly with research. This paper does not address another form of doctoral study, i.e., the "Dr in public health (DrPH)", a doctoral programme intended for practitioners seeking a leadership position in a public health setting.

18. Several schools of public health, mainly in North America (e.g., University of North Carolina) and in the United Kingdom (e.g., London School of Hygiene and Tropical Medicine) have developed DrPH programmes. Accordingly, the content of these programmes include many aspects related to the practice of public health and to institutional leadership.

19. In this document, ASPHER does not address issues related to the DrPH. Topics related to professional doctorates should be addressed in another paper.

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[a] From the list of the glossary of terms that the MEDINE 2 group, coordinated by Chris van Schravendijk (version April 2012). See http://medine2.com/Public/package_07b.html

[b] From the list of the glossary of terms that the MEDINE 2 group, coordinated by Chris van Schravendijk (version April 2012). See http://medine2.com/Public/package_07b.html

Recommendations for admission criteria for PhD candidates

20. The admission criteria are the responsibility of the university and the relevant academic unit. ASPHER recommends following the general principles:

    (i) Admission should be on the basis of a previously obtained Master's degree (Bologna master or post graduate master) or the expectation of obtaining this degree during the doctoral programme. Concerning public health, masters in several disciplines are usually recognized as a valid prerequisite.

    (ii) Entry criteria for all PhD in public health programmes should be the same, including for those concentrating in specific areas (e.g., epidemiology, health services research, health care financing, occupational medicine, etc.)

    (iii) However, there should be some flexibility in the admission criteria, i.e., studies or work experiences that bring a candidate to Master's level may also be accepted.

    (iv) The way in which decisions are made should be explicit, as well as the financial terms of the eventual admission as PhD students, both in the short and in the longer term.

Enrolment

21. The PhD students should be selected on the basis of a competitive and internationally open process.

22. The PhD students should provide written documents for admission, which will be screened in accordance with the criteria for admission by the university and the relevant academic unit.

23. Before enrolling a doctoral student for a specific project, interviews should be conducted with the candidates based on pre-defined criteria for enrolment.

24. Criteria for enrolment should include the following:

    - A demonstrated interest in research and research potential;
    - The scientific quality of the project;
    - The public health relevance of the project, i.e., the potential impact of the results on population health and/or the quality of health services;
    - The availability and appropriateness of the supervisors;
    - The resources needed to complete the project, i.e., the infrastructure, the running costs, the costs of supervision, and the stipend for the doctoral student;
    - An appropriate level of English.

25. To ensure the high quality of PhD programmes, schools and programme directors should limit the number of doctoral students.

26. More generally, the institutional research capacity should be recognized as a vital component in the success of any doctoral programmes (see Glossary below, §96, p.17), including in public health.

PhD programmes in relation to other disciplines

27. Although the situation at the pregraduate level is changing rapidly in several countries (e.g., with the development of bachelor degrees in public health), public health is traditionally a postgraduate field of study. Trainees come from various fields with different educational backgrounds (medicine, social sciences, economics, etc.).
28. The curriculum is therefore interdisciplinary by nature. Thus, the domains, research topics, and doctoral studies are more heterogonous than in other disciplines.
29. There is no single way to cope with the challenge of interdisciplinarity in the management of a doctoral programme. Possible solutions include (i) a large offering of doctoral courses to provide individualization for doctoral students and (ii) setting up a doctoral committee, which includes the relevant disciplines.
30. One example of a formal interdisciplinary curriculum is the MD-PhD programme, offered to the graduates of a faculty of medicine. Students enrol in courses jointly offered by the faculty of medicine and by other faculties, most often natural sciences (see Glossary, §97, p.17). It is possible that schools of public health and faculties of medicine could follow this type of arrangement for doctoral programmes in public health, i.e., integrating public health into a MD-PhD framework. If similar arrangements involving faculties other than medicine are appropriate, this should be also considered for future developments.

Recommendations for PhD studies

Length

31. For the international compatibility of the doctoral degree, the programme must have a time limit. Therefore, the supervisors should ensure goals are realistic both for the student and the research project.
32. PhD programmes normally have a duration equivalent to three or four years full-time commitment. ASPHER recommends setting the minimum and maximum duration to 3 and 5 years, respectively.
33. Special needs of students should be taken into account. The period could be extended in the case of part-time studies up to 8 years. It may be extended further depending on local regulations, i.e., if the doctoral student has been on sick or parental leave.

Structure

34. According to the MEDINE 2 glossary,[a] the definition of PhD programme is all-embracing. The PhD programme "*describes any organisational structure and disciplinary content related to PhD activities, both educational and research*".

a From the list of the glossary of terms that the MEDINE 2 group, coordinated by Chris van Schravendijk (version April 2012). See http://medine2.com/Public/package_07b.html

35. The European PhD in public health model aims to provide students with competences enabling them to become qualified professionals and independent researchers. These professionals should be able to set up studies and programmes creating new, public health relevant knowledge.

36. PhD programmes in public health should maintain close ties between research outcomes and policy makers in public health.

37. A list of competences for master students in public health has been elaborated by the ASPHER Core Competencies Project.[a] This effort was produced in conjunction with a general effort to define competences for public health professionals.[b] [c] PhD programmes likely deserve a similar effort. Such lists have been produced by the University of Basel and by the VITAE network of researchers.[d]

38. Another group is making a similar effort by working on a list of terms primarily intended to offer generic statements of typical expectations of achievements and abilities associated with qualifications that represent the end of each cycle called the "Dublin descriptors".[e]

39. A PhD programme should include original research and scientific training where the doctoral student performs hands-on research, including problem formulation and literature searching, formulation of aims and objectives, followed with study design, analysis, data presentation, and critical assessment of the results.

40. The formal course programme is normally about six months (about 30 ECTS) of the total doctoral programme. As doctoral students in public health have different levels of background knowledge and experience, the amount of additional training needs to be defined on an individual basis. The regulations of the responsible universities or institutions must be taken into account.

41. The formal programme should include general courses that provide the student with insight into public health science. In addition, specialized, up-to-date elective courses, which support students in their scientific training, including theoretical and methodological background, can be offered. Here, international collaboration might assist in broadening course offerings.

42. Another part of the formal courses should be on translational research, policy making and economics.

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a European Core Competences for MPH Education (ECCMPHE), available at: http://2011.aspher.org/pg/file/read/598/european-core-competences-for-mph-education-eccmphe

b ASPHER EPHCCP Philosophy, Process and Vision, available at: http://2011.aspher.org/pg/file/read/599/aspher-ephccp-philosophy-process-and-vision

c European Core Competences for Public Health Professionals (ECCPHP), available at: http://2011.aspher.org/pg/file/read/597/european-core-competences-for-public-health-professionals-eccphp

d Vitae is the UK organisation championing the personal, professional and career development of doctoral researchers and research staff in higher education institutions and research institutes. Further information on: http://www.vitae.ac.uk/

e http://www.bologna-bergen2005.no/Docs/00-Main_doc/050218_QF_EHEA.pdf

43. Training topics such as transferable skills should be part of the formal courses. This includes training of doctoral students in the presentation of their research to various audiences, in university teaching, in linguistic skills, in project management, in evaluation of scientific literature and in networking at the local and international levels. For a full annotated definition of transferable skills, see Glossary in this document, §99, p.18.
44. Students should also gain some competence with academic work at the university, e.g., taking part in the planning of courses and giving supervised lectures at basic public health level.

Mutual recognition of credits

45. Although still in debate, the use of credits is increasingly common in doctoral programmes. In order to promote students' mobility, mutual recognition of course credits between universities should be promoted.
46. Universities should consider offering grants to students who wish to attend course modules at outside institutions, especially for specialised courses in specific topics.
47. Another common tool to increase the interuniversity collaboration is to develop Summer Schools for PhD students.
48. Further aspects of interuniversity and international collaboration should be promoted by ASPHER. See Glossary for some definitions of various forms of collaboration: §102 (p.20), §103 (p.20) and §104 (p.20).
49. However, the mutual recognition of credits should involve a formal process of analysis and consensus. ASPHER will be an active player in defining such a process, possibly in close collaboration with another agency such as the Agency for Public Health Education Accreditation.[a]

[a] http://www.aphea.net/

Quality

50. A formal framework for quality assurance in the PhD programmes should be developed. The programmes should be regularly evaluated both internally and externally.

51. There are basically three dimensions in quality assurance: student, supervisor and research. Each dimension should be assessed specifically.

52. Topics of quality assurance include:

    (i) Regular evaluation of the progress of PhD students (reports, meetings of the thesis committee or a follow-up group, semi-public presentations such as PhD days, abstracts from presentations/posters at international conferences, publications of papers in peer-reviewed journals, etc.);

    (ii) Evaluation of the quality of the doctoral courses through feedback from qualified researchers in the field, the teachers and the students;

    (iii) Evaluation of the quality of the supervisors;

    (iv) Schools linked with bilateral or multilateral agreements should organise site visits once every 5-7 years to review the faculty, coursework, placement of students, quality of students, etc. This should be organised according to the ORPHEUS standards and in close cooperation with the Agency for the Public Health Education Accreditation.

Recommendations for PhD supervision

53. Qualified supervision is an essential component of a successful doctoral programme. Supervision planning should aim to guarantee the scientific qualification of the student and to promote the acquisition of adequate skills and attitudes in order to ensure preparation for a consistent professional career in a European public health context.

54. Concerning formal qualifications, the supervisor should have:

    (i) a doctoral degree or an equivalent degree in one of the disciplines of public health;

    (ii) continuous and on-going high level scientific output in peer-reviewed literature;

    (iii) good interpersonal skills;

    (iv) ability to link with international networks;

    (v) preferably previous experience as a supervisor.[a]

55. Preferably, the supervisor should be a tenured staff and a faculty member at the same institution as the student.

[a] However, the introduction of new faculties as supervisors has to be organised, e.g., to include faculty without tenure on the thesis committee

56. Ideally, the choice of the supervisor should take place before admission to the programme, in order to promote a successful relationship between student and supervisor, as they often have different expectations and needs. There is a clear advantage in making these needs explicitly known and discussed.

57. Concerning roles and responsibilities, the supervisor should:

    (i) preferably follow a formal training as supervisor;

    (ii) provide mentorship through all phases of the PhD study, from the selection of courses to the completeness of the study;

    (iii) support the implementation and the development of the student's research proposal, advise on the literature review, counsel on writing the dissertation, critically review drafts and the final versions of the dissertation and publications, and attend the public defence;

    (iv) advise and encourage other training activities, such as participation in scientific meetings, attendance of external courses, field work, etc.;

    (v) guide the student's timetable throughout the programme and oversee his adherence to the planned schedule; namely, the topic of the thesis should be established within the first six months of the programme;

    (vi) be supportive to the career development of the student.

58. The number of doctoral students per supervisor should be compatible with his or her workload. This clearly depends on local constraints, which should be managed at the local level. However, a maximum number of doctoral students per supervisor should be set up at the local level, and this rule should be applied with respect to the workload.

59. Doctoral students should, where possible, have one co-supervisor and/or an advisory group (thesis committee). Because of the interdisciplinary character of public health research, it is worthwhile to include several experts in the supervision group. If the main supervisor is not a specialist on the specific topic of the PhD thesis, the co-supervisor should likely link the student to relevant researchers in the field.

60. It is recommended that one member of the thesis committee should be external from the institution (faculty, department or institute).

61. The research and project-specific training of each student is primarily the responsibility of the main supervisor, with the support of a co-supervisor or thesis committee.

62. The thesis committee should meet once a year to discuss the progress of the doctoral dissertation.

63. Universities are encouraged to recognize PhD supervision as an element of career development.

64. ASPHER should encourage its members to develop common course for PhD supervisors, considering the possibility to develop web-based courses.

Recommendations for doctoral theses

65. The PhD thesis is the primary basis for evaluating the student's acquired skills in conducting independent, original and scientifically significant research and critically evaluating others' work.
66. The PhD thesis must clearly show that the student has acquired theoretical up-to-date information and methodical skills related to the subject of his or her doctoral programme. It should contain a critical analytical approach, with an understanding of sources of error and differences of opinion.
67. The scientific value of information brought by the PhD thesis should have a level of originality and scientific priority.
68. Preferably, students should write a cumulative thesis based on at least three published papers. In this case, the student should provide a written comment reviewing the literature relevant to the themes addressed in the papers, and explicating the link between the specific topics addressed in the papers.
69. The full list of the student's publications and full copies of the publications directly related to the thesis must be included in the written comment.
70. For a cumulative thesis, at least two of the papers should be published in peer-reviewed scientific journals listed in the databases (Web of Science, Pubmed, Scopus, etc.).
71. The letter from the journal's editorial office confirming a paper's acceptance may substitute for the reprint. If a paper is initially rejected, or if it requires several revisions in response to reviewer comments, the supervisor should decide if the paper is worthy of publication.
72. Preferably, the student should be the first author, or senior author, on at least two of the papers presented for a cumulative thesis.
73. Where the papers are joint publications, co-author statements should document that the PhD student has made a substantial and independent contribution to these papers.
74. As an alternative, a student may be given a choice of writing a full length monograph, i.e., a dissertation.
75. The monograph must follow the internationally recognized structure. It should include sections on a literature review linked to the research objectives and methods to be used, methods, results, discussion and conclusion, as well as sections on relevance to future research and to population health.
76. The benchmark for the monograph should be the equivalent of at least three papers published in internationally peer-reviewed journals.
77. The PhD thesis must be written in the local official language, or in English. If written in the local language, an extended summary of the thesis in English should be submitted together with the thesis. The structure of the summary follows the structure of the thesis (i.e., objectives, aims, methods, achieved results, discussion, conclusions).

Recommendations for doctoral examination process

78. Rules and requirements of the doctoral examination process are defined by the universities or institutions responsible for the graduation of the student.

79. The university and the faculty offices should abide by fair and timely evaluation of the thesis proposal.

Assessment committee

80. Assessment committee is appointed by the university or institution where the doctoral research has been performed.
81. Generally, all committee members should be active senior scientists and faculty members at recognized schools of public health and medical or other relevant faculties.
82. To maintain quality at the domestic level, the assessment committee should include at least one expert external to the institution where the PhD thesis was performed.
83. To maintain quality at the international level and to strengthen the internationalization of the doctoral degree, the assessment committee should include one member from another country. Consequently, an English summary presenting the essential parts of the thesis should be made available for theses written in other languages.
84. Whether the supervisor is allowed to be a member of the assessment committee varies between institutions.

Criteria for the assessment

85. The institution must have clear criteria for the assessment of a thesis, e.g., with regard to the number and standard of articles that are expected, as well as the content and length of the accompanying review. The supervisor should make sure that the candidate receives the list of criteria in writing at an early stage.
86. The thesis must be orally defended. It could be made either in the local language or in English.
87. Preferably, the thesis should be publicly defended in front of an audience comprised of the assessment committee, other professionals and laymen.
88. Ideally, following the candidate's presentation, a general discussion on content and on public health should be initiated and conducted.
89. In the case of a negative assessment of the PhD thesis, the assessment committee should have a range of options available for them. These issues are regulated by the universities.

Suggested topics for the next steps

90. As it is, the above document suggests several actions to be undertaken. Four of them are listed below.
91. Organizing **workshops of supervisors** of PhD students in public health could be a initiative taken by ASPHER and welcomed by the universities. This initiative is related to the central role of supervisors as addressed several times in the report. Such workshops could evolve to more organised forms of collaborations, e.g., to courses for supervisors (as in fact suggested in the document above (§64, p.13).

92. Another aspect to be developed is a document exploring the opportunity to develop a **professional PhD (DrPH)**, i.e., the doctoral programmes offered to students seeking a leadership position in public health institutions (§17 and ff., p.7).
93. A further aspect is the development of a formal process of **quality assurance** of PhD programmes in Europe, in close collaboration with the APHEA.
94. ASPHER should **encourage exchanges between PhD programmes and between PhD students in public health**. One possible form of exchange is to set up "PhD days" as a part of regular professional or research meeting. A prototype of this is the Young Researchers Forum co-organized since 2009 by ASPHER and EUPHA during their joint annual conference.

Appendix 1
Glossary (from MEDINE 2)

95. The list below takes some of the full text definitions provided by MEDINE (Thematic Network for Medical Education in Europe), a network originally established in 2004 as a mechanism for modernising and harmonizing medical education and training across Europe. [a] The list below (as well as the quotations given in the text) refers to the April 2012 version, edited by Chris van Schravendijk.

Institutional research capacity

96. Institutional research capacity is a vital component in the success of doctoral programmes. It is closely related to institutional research strategy and both relate to the choices and points of research focus that institutions have made. Institutional research capacity can be expressed in terms of the funding available for the various research projects within the institution, in terms of the amount of full time equivalent (FTEs) senior research staff in the institution, or in terms of the extent and specifications of the infrastructure and equipment available. Research capacity is therefore specific to certain research areas and scientific domains/disciplines. Senior research staff plays an important role in supervising PhD students, and not too many PhD students should be under the supervision of one supervisor. In this way, institutional research capacity directly influences the quality of doctoral education within a particular institution.

Md-PhD programme

97. The overall idea behind MD-PhD programmes is to train medical students to become the next generation of physician-scientists covering a variety of clinical disciplines and scientific research domains. Doctoral programmes fit into this concept and are usually organized thematically around research domains (neurosciences, immunobiology, cell biology, etc.). In the United States and Canada, dual training starts early in medical school and students can graduate after 4 or 5 years, after which continuation to complete medical studies takes another 2 to 4 years, making the programme run over 7 to 9 years in all. In other regions of the world, such as Europe, MD-PhD training can take a rather different approach. In the Netherlands [or Spain, for example], students often first complete their MD, and only then start doing research during their training in one of the medical specialties. Such studies are often undertaken from within the academic clinical departments in university hospitals and imply work on patients. Whatever the scheme of the MD-PhD programme, the combination of patient care and research work provides a unique experience with an added value for the student. Entrance to these programmes is often competitive and connected to funding.

[a] See http://medine2.com/Public/package_07b.html

PhD thesis

98. The doctoral thesis or PhD thesis in medical sciences [*and in public health in the context of this paper*] is usually based on a hypothesis. The research described in the thesis is the means by which this hypothesis is tested. The aim of the research has to be clearly articulated and in the discussion, the results that are obtained are evaluated in the light of these aims on the one hand and the literature on the other. The doctoral thesis should be a scientifically consistent piece of work in which the central and most important theme should be the personal work of the candidate. The candidate should clearly indicate his or her contribution in results that are based on teamwork. The form of the thesis is not subject to strict rules and regulations. The choice of language is generally open, but English is preferred. The candidate can sometimes choose between a single full text or a collection of published research papers, which are provided with an overall unifying perspective by a reviewing text made by the author of the thesis.

Transferable skills

99. Transferable skills are skills developed through experience which can be used in the workplace. They therefore encompass a very wide range of skills, but the main groups are usually described as people skills, self-reliance skills, general skills and specialist skills. People skills include good communication and customer skills, influencing and negotiation skills, as well as team-working and leadership skills; networking is also an important people skill. Self-reliance skills are concerned with developing confidence and the ability to work independently. Such skills include self-awareness, self-management, showing initiative, resourcefulness and the demonstration of motivation and enthusiasm.
    General skills include numeracy and problem solving skills as well as the ability to plan and organize work. Other general skills include both flexibility and adaptability, including time management. Specialist skills include computer literacy and specific IT skills, and commercial awareness. PhD training provides many opportunities for the development of transferable skills, which will vary between programmes and institutions. Many institutions now provide specific opportunities to develop such skills through workshops and study days.

Professional doctorates

100. In some countries such as the UK, doctorates have diversified and qualifications other than the PhD/DPhil have evolved, often in response to the needs of the professions. The aim of these programmes is to integrate professional and academic knowledge. Students undertaking a professional doctorate are expected to make a contribution to both theory and practice in their field, and to develop professional practice by making a contribution to professional knowledge. Common to all professional doctorates is the completion of an original piece of research. The research is then presented as a thesis, and is examined in the same way as a traditional PhD. Usually the research project relates to real life issues concerned with professional practice. In many cases research is carried out within the student's own organization. Professional and practice-based doctorates have many different structures and attract candidates at different stages of their careers; titles normally reflect the subject or field of study, resulting in a very wide range. The course structure also varies from subject to subject and institution to institution. Most professional doctorates include a large taught or directed study element, which is formally assessed. These components frequently include both the teaching of research methods, and components related to broadening or deepening the students' understanding of the disciplines in which they are researching, or providing them with appropriate transferable skills. As the majority of students undertaking professional doctorates are experienced and practicing professionals, most study for such degrees part-time.

PhD

101. The degree of Doctor of Philosophy is offered to persons who have completed a third-cycle degree at a university. The Zagreb conference in 2004 defined the PhD programme as intended to enable individuals, after completing and defending their PhD thesis, to carry out independent, original and scientifically significant research, and to critically evaluate work done by others. The Zagreb conference also recommends that the minimal requirement for the PhD thesis in medicine and health sciences should be the equivalent of at least three *in extenso* papers published in internationally recognized journals. In addition to the papers presented, the candidate should provide a full review of the literature relevant to the themes in the papers, and, where necessary, a fuller account of the research methods and results.
Where the PhD research is presented in other formats, such as the single monograph, reviewers should demonstrate that the contribution is at least equivalent to this benchmark, and should encourage inclusion of publication from the research. PhD programmes should include a firm theoretical basis as well as the development of technical research skills in taught courses where appropriate. The length of the PhD programme varies from three to five years, but the duration is often longer than this, especially in clinical medicine when research is done part time. Only universities may award the degree of PhD.

Collaborative doctoral programmes

102. Doctoral programmes of universities in different countries could participate in networks hosting their doctoral candidates in international exchange programmes that are funded by European initiatives such as ERASMUS Mundus or Marie Curie Training Networks for PhD students. Many universities offer collaborative doctoral programmes which build on collaboration between different institutions and/or different departments, usually from different scientific disciplines. These are designed to facilitate communication and exchange of knowledge and resources between departments and institutions. Such networks should offer a clear added value for doctoral candidates, in research collaborations as well as in teaching modules. It is clear that the European Research Area will also support such collaborations through, for example, the European Science Foundation.

Joint degrees

103. According to the official Bologna process website, joint degrees should comply with the following six main features: 1. programmes leading to these degrees are developed or approved jointly; 2. students from each participating institution spent part of the programme at other institutions; 3. students spend significant periods of time at the participating institutions; 4. periods of study and exams passed at the partner institution(s) are recognized fully and automatically by all institutions and countries involved; 5. teaching staff from each participating institution devise the curriculum together, form joint admission and examination bodies, and participate in mobility for teaching purposes ; 6. students who have completed the full programme ideally obtain a degree awarded jointly by the participating institutions and fully recognized in all countries. Thus, in joint degrees, the agreements are made between programmes and institutions, and not on behalf of individual students.

International joint doctoral programmes

104. When leading to joint degrees, international joint doctoral programmes can be seen as the most advanced form of internationalization. In joint programmes taught courses and teaching components should be integrated, committees and juries should be shared, and the final degree should bear all the characteristics of a cross institutional document. The use of a credit system in such cases can be considered, but this should not be applied too rigidly. Students should be discouraged from participating in educational activities simply to collect credits. The use of a credit system in doctoral education is currently being discussed.

Appendix 2
Names and email addresses of the ASPHER Working group on doctoral programmes and research capacities (DPRC)

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