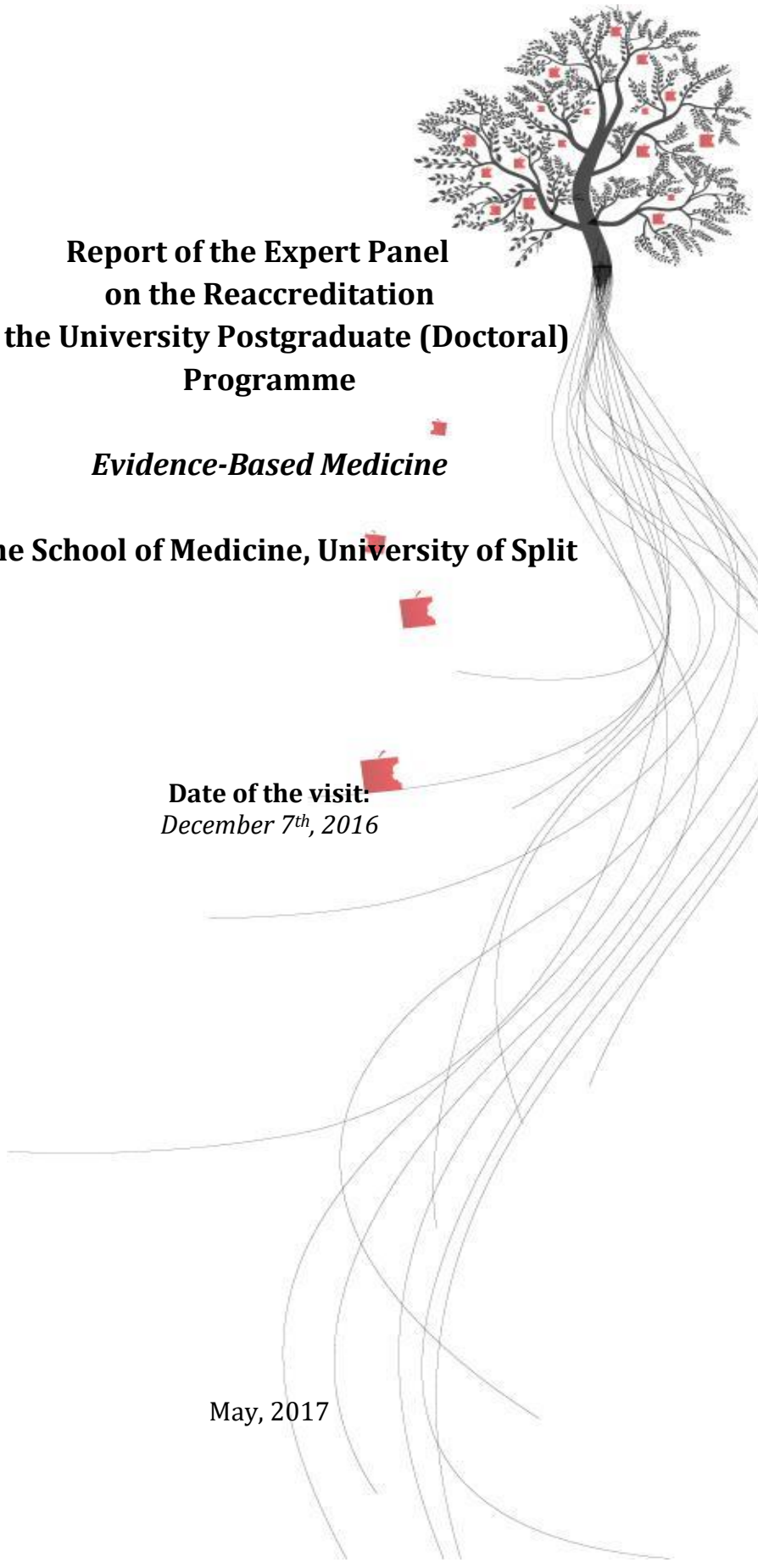

Report of the Expert Panel on the Reaccreditation of the University Postgraduate (Doctoral) Programme

Evidence-Based Medicine

The School of Medicine, University of Split

Date of the visit:
December 7th, 2016

May, 2017

Contents

INTRODUCTION

The Expert Panel appointed by the Agency for Science and Higher Education (ASHE) created this Report on the re-accreditation of the university postgraduate (doctoral) programme in *Evidence-Based Medicine* of The School of Medicine, University of Split on the basis of the Self-Evaluation Report of the programmes, other documentation submitted and a visit to The School of Medicine, University of Split.

The Agency for Science and Higher Education (ASHE), a public body listed in EQAR (European Quality Assurance Register for Higher Education) and a full member of ENQA (European Association for Quality Assurance in Higher Education), re-accredits higher education institutions (hereinafter: HEIs) and their study programmes in line with the Act on Quality Assurance in Science and Higher Education (Official Gazette 45/09) and the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10). In this procedure parts of activities of higher education institutions and university postgraduate study programmes are re-accredited.

Expert Panel is appointed by the Agency's Accreditation Council, an independent expert body, to carry out independent evaluation of post-graduate university study programmes.

The Report contains the following elements:

- Short description of the study programme,
- The recommendation of the Expert Panel to the Agency's Accreditation Council,
- Recommendations for institutional improvement and measures to be implemented in the following period (and checked within a follow-up procedure),
- A brief analysis of the institutional advantages and disadvantages,
- A list of good practices found at the institution,
- Conclusions on compliance with the prescribed conditions of delivery of a study programme,
- Conclusions on compliance with the criteria for quality assessment.

Members of the Expert Panel:

1. Prof. Michael Drinnen, Newcastle University/Freeman Hospital, UK (site visit: Faculty of Medicine Zagreb and Split)

2. Prof. Albert Selva O'Callaghan, Autonomous University of Barcelona/Hospital Universitari General Vall d'Hebron, Spain (site visit: Faculty of Medicine Zagreb and Rijeka)
3. Prof. Gernot Riedel, Aberdeen University, UK (site visit: Faculty of Medicine Zagreb and Split)
4. Arturo Moncada Torres, doctoral student, KU Leuven, Belgium (site visit: Faculty of Medicine Zagreb and Rijeka)
5. Dr. Senthil Kaniyappan, postdoctoral researcher, Max Planck Institute of Metabolism Research and DZNE (German Centre for Neurodegenerative Diseases), Germany (site visit: Faculty of Medicine Zagreb and Split)
6. Dr. Patrycja Kozik, Group Leader, MRC Laboratory of Molecular Biology, Cambridge Biomedical Campus, Cambridge University, UK (site visit: Faculty of Medicine Zagreb and Rijeka)
7. Prof. Peter Hylands, King's College London, UK (site visit: Faculty of Pharmacy and Biochemistry, Zagreb)
8. Prof. Gonzalo Herradón, University CEU San Pablo, Spain (site visit: Faculty of Pharmacy and Biochemistry, Zagreb)
9. Marcin Ciszewski, doctoral student, Medical University of Łódź, Poland (site visit: Faculty of Pharmacy and Biochemistry, Zagreb and The School of Medicine Split)
10. Prof. Gábor Gerber, Semmelweis University, Hungary (site visit: School of Dental Medicine Zagreb and Faculty of Medicine Rijeka)
11. Prof. Robert Allaker, Barts and The London School of Medicine and Dentistry, Queen Mary University of London, UK (site visit: School of Dental Medicine, Zagreb)
12. Prof. Pedro Sousa Gomes, University of Porto, Portugal (site visit: School of Dental Medicine Zagreb)
13. Prof. Daniel W Lambert, University of Sheffield, UK (site visit: School of Dental Medicine Zagreb)
14. Prof. Zdenek Broukal, Charles University, Czech Republic (site visit: School of Dental Medicine Zagreb)
15. Nemanja Sarić, doctoral student, King's College London, UK (site visit: School of Dental Medicine Zagreb and The School of Medicine Split)
16. Prof. Suzanne Held, University of Bristol, UK (site visit: Faculty of Veterinary Medicine Zagreb)
17. Prof. David Sargan, University of Cambridge, UK (site visit: Faculty of Veterinary Medicine Zagreb)
18. Vitalina Drobnytska, doctoral student, University of Greenwich, UK (site visit: Faculty of Veterinary Medicine Zagreb).

The School of Medicine, University of Split was visited by the following Expert Panel members:

- Prof. Michael Drinnen, Newcastle University/Freeman Hospital, UK
- Prof. Gernot Riedel, Aberdeen University, UK
- Dr. Patrycja Kozik, Group Leader, MRC Laboratory of Molecular Biology, Cambridge Biomedical Campus, Cambridge University, UK
- Dr. Senthil Kaniyappan, postdoctoral researcher, Max Planck Institute of Metabolism Research and DZNE-German Centre for Neurodegenerative Diseases, Germany
- Nemanja Sarić, doctoral student, King's College London, UK
- Marcin Ciszewski, doctoral student, Medical University of Łódź, Poland.

In the analysis of the documentation, site visit and writing of the report the Panel was supported by:

- Emita Blagdan, coordinator, ASHE
- Marina Matešić, coordinator, ASHE
- Đurđica Dragojević, ASHE, interpreter at the site visit
- Ivana Rončević, translator of the Report, ASHE.

During the visit to the Institution the Expert Panel held meetings with the representatives of the following groups:

- Management
- Study programme coordinators
- Doctoral candidates
- Teachers and supervisors
- External stakeholders
- Alumni.

The Expert Panel also had a tour of the library, IT rooms, student register desk and the classrooms.

SHORT DESCRIPTION OF THE STUDY PROGRAMME

Name of the study programme: *Evidence-Based Medicine*

Institution providing the programme: University of Split, School of Medicine

Education provider: University of Split, School of Medicine

Place of delivery: Split

Scientific area and field: Biomedicine and Healthcare; fields: Basic Medical Sciences, Clinical Medical Sciences, and Public Health and Healthcare

Learning outcomes of the study programme *Postgraduate University Programme in Evidence-Based Medicine:*

- To describe the goal, purpose and methods of evidence-based medicine and outline its scope and limitations.
- To formulate a meaningful clinical question, collect scientific evidence, appraise critically the results of individual research studies, and review critically the collected evidence.
- To assess the significance of evidence-based medicine for everyday clinical practice and plan the use of evidence in clinical practice.
- To evaluate online sources containing information on evidence-based medicine and appraise critically their content.
- To provide the definitions of accuracy of diagnostic test; calculate the sensitivity, specificity, predictive values, and positive and negative likelihood ratios; and select the best diagnostic test for use in clinical practice.
- To re-examine the results of research on risk factors and causes of health outcomes and compare patient survival depending on the treatment method.
- To calculate positive and negative treatment effects and, on the basis of the results obtained, choose the most appropriate treatment method for patients with particular health conditions.
- To describe the criteria of causality and assess the effectiveness of preventative activity for an individual and entire population.
- To evaluate the disease burden of the leading health risks and diseases. Understanding the characteristics of research designs in biomedical area.
- Understanding the differences between different research designs, their advantages and disadvantages, the ability of designing independently one's own research study for the needs of writing a research paper and dissertation.

- To identify, describe, and explain the advanced statistical analysis methods and research errors.
- To appraise critically if data analyses described in research papers are appropriate from the statistical analysis point of view.
- To demonstrate acquired knowledge and skills by independently evaluating research papers in order to answer the clinical questions encountered in everyday clinical work.
- To demonstrate the use of EBM calculator for quick and simple evidence assessment.
- To create a successful research plan that will result in a convenient and reliable outcome of writing one's own research paper and doctoral dissertation.

Number of doctoral candidates: overall, there are currently 118 active doctoral students
Number of potential mentors: 101

RECOMMENDATION BY THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL

It is the overarching opinion of the panel that this programme does not meet all the requirements stipulated by the Accreditation Council. While we feel that the majority of the relevant laws and bylaws have been met, the panel has identified a number of critical issues which the School of Medicine and the Programme directors should seek to address over an extended period. It is our impression that both Programme director and supervisors/mentors very openly discussed these concerns and are themselves aware that improvements can and should be implemented (and examples are even listed in the self-evaluation document). This may not be achievable overnight, requires regular internal audits and a careful analysis of (what is noted as limited) finances and how they can creatively ring-fence in an imaginative and more student friendly manner. A time frame of 3-5 years has been considered as appropriate to implement these changes and the panel suggests at least one interim Expert Audit to monitor progress, provide support and further advice on the planned changes that are in progress.

Upon the completion of the re-accreditation procedure and the examination of the materials submitted (Self-Evaluation Report etc.), the visit to the higher education institution and interviews with HEI members in accordance with the visit protocol, the Expert Panel renders its opinion in which it recommends to the Accreditation Council of the Agency the following:
issue a letter of expectation for the period up to three (3) years in which period the higher education institution should initiate the necessary improvements.

ASSESSMENT STRATEGY

The assessment of this programme took into account the detailed reports of the post-graduate University study programmes and was pursuant of the *Act on Quality Assurance in Science and Higher Education*. Special weight was given to the self-nominated study objectives, and how these are contained within best practice as stipulated in **the Bologna Seminar on "*Doctoral Programmes for the European Knowledge Society*"** (for detail and definitions, see below).

i. *The core component of doctoral training is the advancement of knowledge through original research.* At the same time it is recognised that doctoral training must increasingly meet the needs of an employment market that is wider than academia.
ii. *Embedding in institutional strategies and policies:* universities as institutions need to assume responsibility for ensuring that the doctoral programmes and research

training they offer are designed to meet new challenges and include appropriate professional career development opportunities.
iii. *The importance of diversity:* the rich diversity of doctoral programmes in Europe – including joint doctorates – is a strength which has to be underpinned by quality and sound practice.
iv. *Doctoral candidates as early stage researchers:* should be recognized as professionals – with commensurate rights – who make a key contribution to the creation of new knowledge.
v. *The crucial role of supervision and assessment:* in respect of individual doctoral candidates, arrangements for supervision and assessment should be based on a transparent contractual framework of shared responsibilities between doctoral candidates, supervisors and the institution (and where appropriate including other partners).
vi. *Achieving critical mass:* Doctoral programmes should seek to achieve critical mass and should draw on different types of innovative practice being introduced in universities across Europe, bearing in mind that different solutions may be appropriate to different contexts and in particular across larger and smaller European countries. These range from graduate schools in major universities to international, national and regional collaboration between universities.
vii. *Duration:* doctoral programmes should operate within appropriate time duration (three to four years full-time as a rule).
viii. *The promotion of innovative structures:* to meet the challenge of interdisciplinary training and the development of transferable skills.
ix. *Increasing mobility:* Doctoral programmes should seek to offer geographical as well as interdisciplinary and inter-sectoral mobility and international collaboration within an integrated framework of cooperation between universities and other partners.
x. *Ensuring appropriate funding:* the development of quality doctoral programmes and the successful completion by doctoral candidates requires appropriate and sustainable funding.

- **CroQF, level 8.2:**

Descriptors of learning outcomes for this level are:
knowledge - creating and evaluating new facts, concepts, procedures, principles and theories in a field of research that extends the frontier of knowledge;
cognitive skills - using advanced, complex, original, highly specialized knowledge, skills, activities and procedures required for developing new knowledge and new methods as well as for integrating different fields;
practical skills - creating, evaluating and performing new proposed specialized activities and new methods, instruments, tools and materials;

social skills - creating and applying new social and generally acceptable forms of communication and cooperation in interaction with individuals and groups of different affiliations and different cultural and ethnical origin;
autonomy - demonstrating personal, professional and ethical authority, managing scientific research activities and a commitment to development of new ideas and/or processes;
responsibility - taking ethical and social responsibility for successful execution of research, socially beneficial results and potential social consequences.

- **EU Principles for Innovative Doctoral Training:**

Research Excellence
Striving for excellent research is fundamental to all doctoral education and from this all other elements flow. Academic standards set via peer review procedures and research environments representing a critical mass are required. The new academic generation should be trained to become creative, critical and autonomous intellectual risk takers, pushing the boundaries of frontier research.

Attractive Institutional Environment
Doctoral candidates should find good working conditions to empower them to become independent researchers taking responsibility at an early stage for the scope, direction and progress of their project. These should include career development opportunities, in line with the European Charter for Researchers and the Code of Conduct for the Recruitment of Researchers.

Interdisciplinary Research Options
Doctoral training must be embedded in an open research environment and culture to ensure that any appropriate opportunities for cross-fertilisation between disciplines can foster the necessary breadth and interdisciplinary approach.

Exposure to industry and other relevant employment sectors
The term 'industry' is used in the widest sense, including all fields of future workplaces and public engagement, from industry to business, government, NGO's, charities and cultural institutions (e.g. musea). This can include placements during research training; shared funding; involvement of non-academics from relevant industry in informing/delivering teaching and supervision; promoting financial contribution of the relevant industry to doctoral programmes; fostering alumni networks that can support the candidate (for example mentoring schemes) and the programme, and a wide array of people/technology/knowledge transfer activities.

International networking
Doctoral training should provide opportunities for international networking, i.e. through collaborative research, co-tutelle, dual and joint degrees. Mobility should be encouraged, be it through conferences, short research visits and secondments or longer stays abroad.

Transferable skills training
"Transferable skills are skills learned in one context (for example research) that are useful in another (for example future employment whether that is in research, business etc.). They enable subject- and research-related skills to be applied and developed effectively. Transferable skills may be acquired through training or through work experience". It is essential to ensure that enough researchers have the skills demanded by the knowledge based economy. Examples include communication, teamwork, entrepreneurship, project management, IPR, ethics, standardisation etc.

Business should also be more involved in curricula development and doctoral training so that skills better match industry needs, building on the work of the University Business Forum and the outcomes of the EUA DOC-CAREERS project.6 There are good examples of interdisciplinary approaches in universities bringing together skills ranging from research to financial and business skills and from creativity and design to intercultural skills.

Quality Assurance
The accountability procedures must be established on the research base of doctoral education and for that reason they should be developed separately from the quality assurance in the first and second cycle. The goal of quality assurance in doctoral education should be to enhance the quality of the research environment as well as promoting transparent and accountable procedures for topics such as admission, supervision, awarding the doctorate degree and career development. It is important to stress that this is not about the quality assurance of the PhD itself rather the process or life cycle, from recruitment to graduation.

The common approach should provide a framework of reference, whilst preserving flexibility and autonomy for institutions and doctoral candidates.

These guiding principles seek to establish a common benchmark for scope and quality in PhDs across the EU, in order that qualifications have extrinsic value and can be considered transferrable between member countries. Strategic decisions about the programme should always be made in the best interests of patients and healthcare across the EU in general, and the rest of the world if appropriate. This is in keeping with

the research priorities of national agencies such as NICE (National Institute for Health and Care Excellence), as well as the major national and international funding bodies (NIH, NIAAA, MRC, etc.).

ADVANTAGES OF THE STUDY PROGRAMME

1. **Engagement of Programme director and some mentors in the programme:** the discussion revealed that the programme directors are very passionate about their programme, have achieved a considerable amount of progress in the past and are fully aware of the difficulties and problems they face.
2. **PhD programme enhances scientific perspectives:** It was generally felt that alumni and student liked the challenge provided by the programme and the scientific work (as opposed to their day-t-day routine).
3. **Some degree of Internationalisation:** The panel noted that some supervisors have existing collaborations with international (oversea) partners and the programme gains from these interactions. This should be extended.
4. **Statistics and general skills:** The panel noted that courses on generic skills and statistics are widely appreciated by the candidates and appeal to them independent of study subject. These should be maintained as 'core' subjects in future and be maintained.

DISADVANTAGES OF THE STUDY PROGRAMME

1. **Recruitment:** The panel observed that recruitment in this postgraduate programme is by assignment rather than via selection from applications in response to adverts. This produces considerable bias and was observed as a negative. The panel discussed the opportunity of setting up an interview panel and advertising the PhD posts more globally thereby enabling recruitment at a European (or international) level.
2. **Monitoring and statistics:** Some uncertainty exists as to the numbers provided in the report, both for students enrolled, but also for completion rates and progress tracking. This seems to arise from a very loose policy on student progress, which means that students can be 'in the system' for many years and their progress is not appropriately monitored. It is unclear to the panel how or whether failing students would be identified early or picked up in time to prevent them from dropping out of the programme. In addition, there is no monitoring of supervisors and their success rates as a metric for future candidates to select their research topic based on completion rates and length of study.
3. **Taught courses:** The panel observed an unusually high number of taught courses especially for 1st year post-graduate students. This is not singled out for

this programme, but appears to be a nationwide requirement underlying most if not all post-graduate programmes. Extensive course work for achievement of credits places considerable strain on the system, as it requires an enormous number of teachers, who work long hours in order to accommodate shifts of the full-time employed post-graduate candidates. Possibly more specific to this programme was the time-tabling of these courses, which appears to overlap considerably with work requirements during residency of the students. This requires enormous discipline from the students to participate in what constitutes evening courses and amounts to night-time revision. We have carefully analysed the provided course catalogue and have, as confirmed by students, grave concerns of the utility of these courses in terms of relevance for the programme and economics. In practice, year One of the programme is basically made up of taught course work and thus precludes extensive laboratory practice and scientific pursuit. These latter elements, however, are at the forefront of European PhD programmes and are critical objectives underpinning post-graduate education. At the same time, considerable financial support is re-directed towards the teachers and could be freed up in benefit of the post-graduate students and mentors.

4. **Depth of study in PhD research:** Considerable variability was observed as for the amount of practical work that making up the thesis. Clearly, some variance is expected, but the heterogeneity was significant in terms of scientific breadth and analytical depth as compared within and between the post-graduate programmes, but also in relation to other European institutions represented by the panel members.

   Notwithstanding biases arising from the selection of theses provided, a high percentage reported on a single research topic, were compressed to <100 pages, and contained brief Methods and short Result sections. In comparison to the European norm, this is typically more in keeping with a Masters (MPhil or MD) thesis, approximating to no more than two years of full-time research work. In the European context, the panel feel it unlikely that this would be considered an adequate synthesis of a 3-4 year programme of PhD-level work. Of course it is difficult to judge the scientific quality of a thesis written in an unfamiliar language.
5. **Single mentoring:** As a standard, students have only a single PhD mentor/supervisor. We note that in the majority of cases the relationship works well and any contentious issues are readily resolved between supervisor and candidate. In the context of student support, however, panel members felt it inappropriate and problematic if it comes to issues and problems between students and mentors that are not amicably resolved. There is a near complete lack of an appropriate structural framework that will support the student during

phases of personal/scientific disagreement with their respective supervisors and these needs to be established.

6. **Completion rate:** Despite poor statistics, we understand that completion rates are low in this programme (only 14 completed so far) both compared to other post-graduate programmes examined, but more so when compared to PhD completion rates in other EU member countries. Of particular concern is the lack of a clear monitoring here, as it remains elusive what happens to the students that initially enrol. A conflict between PhD students and mentors, as well as full-time employment as standard for many Croatian students may reduce their commitment for post-graduate studies. While these are reported case studies, the panel members cannot ignore that possibility that they are more widespread. In addition, students may stay in the system almost indefinitely, and in some cases it does not become apparent that they are failing (again due to lack of monitoring).

EXAMPLES OF GOOD PRACTICE

1. **Generic skills and statistics courses** (see above).
2. **Equal status for thesis in English.** Fostering the internationalisation of the programme, and to establish equity with other HEIs in Europe, the write-up of the thesis in English language has been given equal status. This was a positive outcome. However, the uptake of this opportunity was relatively low, but should be actively promoted (for example by the inclusion of overseas supervisors and examiners with the view of strengthening international research collaborations at the same time).
3. **Publication as a metric for the student's quality.** The panel are encouraged by the use of publications as an index for the student's quality and progress. At the same time, this is not immediately linked with impact factors. More relevant is the documentation of independent thought and scientific analysis.
4. **Employment during study.** A double edged sword is the continuous employment of candidates at the University of in hospitals. This appears to guarantee financial support independent of the length of study, but needs to be weight against additional work load. Overall, it seems that candidates are content with this situation – we never heard about financial troubles. This is certainly different in other European systems.

RECOMMENDATIONS FOR THE IMPROVEMENT OF THE STUDY PROGRAMME

1. **Entry requirements.** The panel was surprised of the low competition for admission to the programme, but also by the low number of projects on offer. This indicates little appetite from staff to offer research projects to young and upcoming faculty. Were this programme to succeed, this is one of the most immediate points of remedy. Programme directors and the School are required to take some imaginative and creative steps to improve this situation (for example each faculty has to offer one PhD project which is filled through a competitive approach – advertisement; interviews, etc.), possibly coupled with a reward structure.
2. **Increase of depth of the PhD programme.** For equity with other EU programmes, individual PhD topics currently lack substance and focus. These need to be improved or no longer pursuit. Our suggestion is that a more hypothesis and laboratory based system is adopted. Coincident is the expectation that a PhD student would have at least two major sub-themes or lines of enquiry that test different skill-sets of the candidate.
3. **Reduction of taught courses.** In order to deliver on (1), the honing down of taught courses, particularly in year 1 of the PhD, needs to be considered. Both students and teachers are weary of front-loading the PhD programme with an enormous amount of lectures that will often remain too abstract and not supportive of the practical work. Exceptions are generic skills that have to remain central to the early education programme, but more in depth special knowledge relevant to each individual PhD topic should be acquired by self-study or alternative means (presentation at lab meetings; scientific interactions with supervisor; regular study reports; etc.). Overall, we promote a more project based, hands on approach for the achievement of merit, and a reduction of the taught courses based approach of gaining credits. Some creativity of the staff involved in this programme is required.
4. **Multiple supervisors for each PhD project.** The panel felt very strongly, that the single mentor/supervisor system is outdated and needs to become replaced by a system where the student has a second supervisor allocated, who is familiar with, but not necessarily a specialist, of the research field. Her/his function is more a pastoral and supportive one and should be documented by regular meetings with the PhD student in order to help monitoring progress, but also to identify problems early on and diffuse them. This is particularly important for multidisciplinary projects, where supervisors should come from the co-disciplines, and where more than 2 mentors may be named. We also promote the

inclusion of external supervisors (for example when students deliver parts of international collaborations).

5. **Monitoring of student progress.** The panel felt that a more defined framework needs to be developed that monitors and documents the progress of the student by regular reviews (incl. summary reports co-signed by supervisor and student). It should include measures of quality and achievement of milestones. At the same time, slow progression and non-achievers need to identified early and contingencies put in place for help to improve the student's prospects for achievements. Yet again, these support structures and their success/failure needs to be monitored and revised. Third party assessors, who can judge the scientific progress of the candidate, may be included in this process.
6. **Monitoring of supervisors.** We found the complete absence of any quality control of the supervisors. As for the student side, a more formal framework needs to be developed that tracks the success (failure) of supervisors and helps identification of those supervisors that are struggling. It is our belief that such a system lies mostly dormant as other monitoring structures (for student, co-supervision, etc.) will help to identify problems and they can be remedied prior to any severe breakdown of the supervisor-student relationship. It nevertheless should be set up for good practice.
7. **Length of PhD (part time):** There is considerable heterogeneity about the length of each individual PhD project. While the panel accepts this is necessary as each individual has specific circumstances, we strongly suggest some form of curtailment of the overall study period. On one hand, this would be aided by better monitoring structures and milestone definitions, but also by a more stringent handling of drop-out and re-joining back after years of interruption. That PhDs are achievable in a predefined time frame is clear from the fact that most students complete their study in ~6 years. This also raises the issue of scientific relevance of the study subject, as highly competitive research cannot wait such a long time, thereby creating a number of thesis that are 'niche market' and of low interest to society as a whole.
8. **PhD supports clinical specialisation:** We encountered that most students also fulfil full-time jobs in hospitals or clinical praxis. This 'over'-load may provide a rationale for the elongated time lines of some PhDs and the seemingly low completion rate. While all stake-holders of this PhD programme support its existence and clearly identified the benefit for the student and its scientific career prospects, freeing up time of the candidate is inevitable. It must be in the interest of all stake holders to present with the best educated workforce that is knowledgeable in cutting edge technology, pharmacology etc. This can only be guaranteed if provision of time is made for their candidates to undertake such

research as much as they will support the continuous personal development of the doctors once their specialisation has been completed.

9. **Student involvement and awareness:** The panel was surprised how negligent students are about the framework of the individual PhD programmes across Croatia as a whole, but also this one. We suggest that students together with supervisors/mentors, the School and stakeholders unify for a restructuring and that a more proactive view is taken to ensure all candidates are fully compliant with requirements, but also knowledgeable in support structures. We understand that the formation of a School for Post-graduate Education is in planning and this will provide a unique opportunity for implementation of these urgently needed changes.

COMPLIANCE WITH THE PRESCRIBED CONDITIONS FOR THE DELIVERY OF A STUDY PROGRAMME

Minimal legal conditions:	**YES/NO Notes**
1. Higher education institution (HEI) is listed in the Register of Scientific Organisations in the scientific area of the programme, and has a positive reaccreditation decision on performing higher education activities and scientific activity.	YES
2. HEI delivers programmes in the two cycles leading to the doctoral programme, i.e., first two cycles in the same area and field/fields (for interdisciplinary programmes), and employs a sufficient number of teachers as defined by Article 6 of the Ordinance on the Content of a Licence and Conditions for Issuing a Licence for Performing Higher Education Activity, Carrying out a Study Programme and Re-Accreditation of Higher Education Institutions (OG 24/10).	YES
HEI employs a sufficient number of researchers, as defined by Article 7 of the the Ordinance on Conditions for Issuing Licence for Scientific Activity, Conditions for Re-Accreditation of Scientific Organisations and Content of Licence (OG 83/2010).	YES
3. At least 50% of teaching as expressed in norm-hours is delivered by teachers employed at the HEI (full-time, elected into scientific-teaching titles).	YES
4. Student: teacher ratio at the HEI is below 30:1.	YES
5. HEI ensures that doctoral theses are public.	YES

6. HEI launches the procedure of revoking the academic title if it is determined that it has been attained contrary to the conditions stipulated for its attainment, by severe violation of the studying rules or based on a doctoral thesis (dissertation) that has proved to be a plagiarism or a forgery according to provisions of the statute or other enactments.	YES
Additional/recommended conditions of the ASHE Accreditation Council for passing a positive opinion	**YES/NO Notes**
1. HEI (or HEIs in joint programmes) has at least five teachers appointed to scientific-teaching titles in the field, or fields relevant for the programme involved in its delivery.	YES
2. In the most recent reaccreditation, HEI had the standard Scientific and Professional Activity marked as at least "partly implemented" (3).	YES
3. The doctoral programme is aligned with the HEI's research strategy.	YES
4. The candidate: supervisor ratio at the HEI is not above 3:1.	YES
5. All supervisors meet the following conditions: a) PhD, elected into a scientific title, holds a scientific or a scientific-teaching position and/or has at least two years of postdoctoral research experience; b) active researcher in the scientific area of the programme, as evidenced by publications, participation in scientific conferences and/or projects in the past five years (table 2, Supervisors and candidates); c) confirms feasibility of the draft research plan upon admission of the candidate (or submission of the proposal); d) ensures the conditions (and funding) necessary to implement the candidate's research (in line with the draft research plan) as a research project leader, co-leader, participant, collaborator or in other ways; e) trained for the role before assuming it (through workshops, co-supervisions etc.); f) received a positive opinion of the HEI on previous supervisory work.	NO (b, c, e) (some have no research activity or project activity in last 5 years)
6. All teachers meet the following conditions: a) holds a scientific or a scientific-teaching position; b) active researcher, recognized in the field relevant for the course (table 1, Teachers).	NO (some have no research activity)
7. The supervisor normally does not participate in the assessment committees.	YES
8. The programme ensures that all candidates spend at least three years doing independent research (while studying, individually, within	NO

or outside courses), which includes writing the thesis, publishing, participating in international conferences, field work, attending courses relevant for research etc.	
9. For joint programmes and doctoral schools (at the university level): cooperation between HEIs is based on adequate contracts; joint programmes are delivered in cooperation with accredited HEIs; the HEI delivers the programme within a doctoral school in line with the regulations and ensures good coordination aimed at supporting the candidates; at least 80% of courses are delivered by teachers employed at HEIs within the consortium.	N/A

QUALITY ASSESSMENT

	Improvements are necessary **(IN)** ***High Level of Quality*** **(HQ)**
1. RESOURCES: TEACHERS, SUPERVISORS, RESEARCH CAPACITIES AND INFRASTRUCTURE	
1.1. HEI is distinguished by its scientific/artistic achievements in the discipline in which the doctoral study programme is delivered.	**HQ:** The report outlines the history and progress of EBM PhD programme and its precursors. Noteworthy in this context is the BCMS programme, from which considerable reputation delivered the accreditation to University Hospital Center. It was succeeded by a novel and collaborative programme of 'Applied Physiology' what was soon cancelled. However, its international flair did attract little exchange between Norwegian and US participating Institutions. It was replaced by EBM, a highly attractive programme with over 100 students currently enrolled.
1.2. The number and workload of teachers involved in the study programme ensure quality doctoral education.	**HQ:** The panel found the quality satisfactory. It was however not completely transparent how many students are enrolled in each course and whether resources are managed to the maximum efficiency. Low uptake (decreasing the enrolment quotas) could be used for weeding out the irrelevant courses, and putting caps in place may help to run specific courses only when more than X students participate.
1.3. The teachers are highly qualified researchers who actively engage with the topics they teach, providing a quality doctoral programme.	**IN:** The research records of the teachers are highly variable. A few are exceptional, and the panel recognised the body of international work as expressed clearly in the report. Nevertheless, there is a number of teachers low research activity and
1.4. The number of supervisors and their qualifications provide for	**IN:** The programme is broadly compliant with good

quality in producing the doctoral thesis.	practice. However, there are 1) the issue of the small number of supervisors interested in supporting EBM; and 2) the issue of single supervisors for each student. While the former will take some time and creativity, the resolve of the latter appears straightforward.
1.5. The HEI has developed methods of assessing the qualifications and competencies of teachers and supervisors.	**HQ:** While there are indirect measures of mentor quality - for example, publication record - this does not necessarily assess the competency of the individual in mentoring. The School, however, includes winners of the MSES awards (all categories) as teachers for EBM and research leaders of some of the most ambitious research projects in Croatia. While this is all positive, we specifically note that there is no body set up that deals with the performance of supervisors. Several putative metrics could be used, amongst which we find the number of publications with PhD candidates as contributing or even first authors as the most revealing.
1.6. The HEI has access to high-quality resources for research, as required by the programme discipline.	**IN:** The panel has not rigorously queried this point but extensive discussions clearly revealed monetary constraints. While we are uncertain about access to some important publications, e.g. ScienceDirect, we are equally unclear about laboratory instrumentation or shared centres.
2. INTERNAL QUALITY ASSURANCE OF THE PROGRAMME	
2.1. The HEI has established and accepted effective procedures for proposing, approving and delivering doctoral education. The procedures include identification of scientific/ artistic, cultural, social and economic needs.	**HQ:** The leadership team described a strong history of delivering doctoral-level training, and have shown national leadership in this area. The report set down the reasons for establishing the programme which evolved from precursors (see 1.1), and included an analysis of social, academic and economic needs of the community.

2.2. The programme is aligned with the HEI research mission and vision, i.e. research strategy.	**IN:** The strategic document for research activity 2014-2010 was found valid and current, but we suggest to the School to think through its three doctoral programmes (with significant and for international standards unusually high and overburdening number of doctoral students) of different quality and the role of doctoral school. Additionally, supervisors/mentors of EBM programme contribute and shape Croatian science significantly, though this is not accordingly documented in the successes of winning grant support and the resulting scientific output. Consequently, EBM forms an integral part of the School of Medicine and, with improvements, could direct research strategies relevant for Croatia and neighbouring countries.
2.3. The HEI systematically monitors the success of the programmes through periodic reviews, and implements improvements.	**IN:** The overall monitoring practices were fragmented and in need of an overhaul with stricter timelines and better defined proxies that objectively measure programme and candidate progress. A formal monitoring and feedback process was not seen. Although the School has established a 'council of studies' that monitors the progress of all PhD programmes, it remained unclear to the panel who belongs to this body, what exact procedures are in place to monitor the programmes and its members, and how and what actions are taken (and implemented) in case of unsatisfactory performance. Establishment of a more stringent system would align the programmes to European counterparts, in which national agencies reports yearly updates on the success of students and their timely progress is a proxy for the success of the PhD programme.
2.4. HEI continuously monitors supervisors' performance and has mechanisms for evaluating supervisors, and, if necessary,	**IN:** This is one of the most significant issues that the panel has identified. The panel identified very clear shortfalls in the way supervisors are assessed and

changing them and mediating between the supervisors and the candidates.	their performance is monitored. There is no clear system in place for monitoring the performance of supervisors. The so-called 'direct' measures of impact factor don't necessarily relate to good supervision. What is missing is a more objective measurement of the trajectory of each individual student in connection with his/her mentor and how they perform over time. In addition, there appears to be no regular questionnaires delivered from the PhD students that quality assess their own supervisor. Moreover, there is also a lack of framework to resolve serious matters between student and supervisor. These are urgently required. Cases of change of supervisor have not been reported.
2.5. HEI assures academic integrity and freedom.	**HQ:** This issue was not discussed in depth. The University has guidelines on integrity and ethics. We are led to believe that the University does not employ systematic methods of plagiarism detection, and this might be considered for the future.
2.6. The process of developing and defending the thesis proposal is transparent and objective, and includes a public presentation.	**HQ:** Documentation regarding the procedures of production and evaluation of doctoral thesis proposal was provided. The Study Council is responsible for the evaluation of the thesis proposal. Documentation regarding a detailed proposal defence protocol was provided for review.
2.7. Thesis assessment results from a scientifically sound assessment of an independent committee.	**IN:** Documentation describing the thesis development, structure, and defence was provided for review. The panel had the opportunity to review a selection of theses produced from the programme. Comments on the overall quality of theses are provided at the top of the document.
2.8. The HEI publishes all necessary information on the study	**HQ:** The panel had the opportunity to review a selection of

programme, admissions, delivery and conditions for progression and completion, in accessible outlets and media.	programme documentation and this was deemed satisfactory.
2.9. Funds collected for the needs of doctoral education are distributed transparently and in a way that ensures sustainability and further development of doctoral education (ensures that candidates' research is carried out and supported, so that doctoral education can be completed successfully).	**HQ:** The panel was made aware of the major cost centres which are broadly the same as for any other Higher Education Institution in Europe. We did not gain insight, however, how the funds are distributed. Nevertheless we acknowledge that the fees for the programme are subsidised, and offer good value for money for students. Nevertheless, the EBM programme director actively seeks to leverage additional funds as a percentage of fees.
2.10. Tuition fees are determined on the basis of transparent criteria (and real costs of studying).	**HQ:** See previous response.
3. SUPPORT TO DOCTORAL CANDIDATES AND THEIR PROGRESSION	
3.1. The HEI establishes admission quotas with respect to its teaching and supervision capacities.	**IN:** The selection process of candidates and their admission to the programme is organised by the Study Council. However, criteria are undefined. Typically, 'the best students' (unclear about selection process) are assigned to 'the best mentors' (unclear how defined). Although these statements are quotes from the self-evaluation document, neither teachers /mentors nor the directorate seemed are fully content about the practicalities of this process.
3.2. The HEI establishes admission quotas on the basis of scientific/ artistic, cultural, social, economic and other needs.	**IN:** No quotas are pre-defined. The selection is based on the assessment of a three person's PhD Programme Committee, which upon examination of the proposal and the candidate's research topic recommend acceptance/rejection to the PhD Programme Committee. The criteria for selection are not defined and their

	context remains elusive. There is no selection process for aspirants in terms of future career plans. This systems is student driven and requires intensive work between mentor and candidate prior to any assurance that the project may succeed and any funding be awarded. A corollary is that mentors may find it unsatisfactory (consequently the low interest in participation) and candidates may consider it too risky. An alternative more rewarding system could place the support into the mentor's hands. She/he defends her/his project, gets awarded the support and then advertises the project, followed by application from multiple candidates and an interview based selection of the best suited applicant.
3.3. The HEI establishes the admission quotas taking into account the funding available to the candidates, that is, on the basis of the absorption potentials of research projects or other sources of funding.	**IN:** A formal candidate selection process is not described, although I would imagine that the candidate's performance during the project debate may be used as an indicator for qualification. However, at this stage, the candidate has already been preselected by the mentor and this selection process remains undefined. Thus, candidate selection followed different rules to the ones provided as guidelines. Since the majority of students enrolled in the programme are derived from clinical practice and hospitals, they are self-funded, i.e. pay their own tuition. Given the overall constraints for financial support from the HEI (and clinics), the available resources will not amount to extensive and properly powered studies in these cases (which may explain low impact publications on one hand, but also the slow progression of candidates).
3.4. The HEI should pay attention to the number of candidates admitted as to provide each with an advisor (a potential supervisor). From the point of admission to the end of doctoral education, efforts are	**IN:** No clear structures are in place to monitor this process. It would fall into the remit of the PhD Programme committee, but the handling appears more ad-hoc and on a case-by-case basis. As to the sustainability, which is more the realm of

invested so that each candidate has a sustainable research plan and is able to complete doctoral research successfully.	mentor and student, we take the relatively high drop-out/inactive rate (about thirty %) as an index for either personal or programme related difficulties. It is critical to determine the reasons for drop-out as a substantial amount of candidates diffuses out of the system and considerable resource and effort (both by candidate and by mentor) are wasted. Given the financial limitations of the programme, such wastage must be avoided.
3.5. The HEI ensures that interested, talented and highly motivated candidates are recruited internationally.	**IN:** The panel did not identify clear efforts of the HEI to recruit internationally. We noted that there are very few international students due to European collaborations, but the principle recruitment of PhD candidates is from a pool of local residents. These are selected on a one-on-one basis depending on experience between the students and the (potential) supervisors. Discussions revealed that about 95% of candidates are local and from the medical profession. Consequently, there is little if any internationalisation of this programme. On a positive note, the program does invite international speakers and lecturers frequently.
3.6. The selection process is public and based on choosing the best applicants.	**HQ:** Calls are public and selection is based on qualification including a point base, depending on different criteria such as previous experience, academic background, publication track, participation in national and international conferences, etc. The self-evaluation document describes an interview process, but no details are mentioned. The final decision of admission rests with the Study Council.
3.7. The HEI ensures that the selection procedure is transparent and in line with published criteria, and that there is a transparent complaints procedure.	**HQ:** The selection procedure is transparent and the list of accepted candidates is made public. Rejected candidates can get feedback on their application (including comments and guidelines on possible

	improvements for further applications) on request and a complaints procedure is in place.
3.8. There is a possibility to recognize applicants' and candidates' prior learning.	**HQ:** According to University regulations this is compliant. Previous expertise of the applicants is recognised through a predefined credit system.
3.9. Candidates' rights and obligations are defined in relevant HEI regulations and a contract on studying that provides for a high level of supervisory and institutional support to the candidates.	**IN:** The panel established that both students and supervisors sign and receive a copy of a document describing their rights and obligations. However, students do not give this proper attention and see it only as part of the paperwork for their enrolment in the programme. Furthermore, students appear to lack knowledge of monitoring or complaints procedures during their PhD, and recognised the post-graduate office as the formal point to resolve all difficulties. Student and supervisor should go through these documents (again) during their first meeting. Some students were completely ignorant of the context of the document.
3.10. There are institutional support mechanisms for candidates' successful progression.	**IN:** Though there are some informal mechanisms in place to monitor the progress of the students, the panel remained in the dark as to the regularity of these processes, the initiation process and their use, which effective procedures are applied to assess student progress, any formal follow-up and feedback to the candidate, or putative mechanism for rescuing failing students. It appears that all mechanisms are activated ad hoc upon request of the students only, which has the potential to lead to bad time/resource management. A more formal and structured evaluation plan needs to be developed so that regular meetings and progress monitoring is initiated automatically and follow-up mechanisms are in place (i.e., have specific milestones been met). The self-evaluation report states that this is all the role of the Study Council, but it appeared through our

	discussions that little activity is implemented in practice. Financially, The School supports a total of 11 first year PhDs. However, only one is allocated to EBM. The financial support of the other 19 new entries remains elusive at this stage.
4. PROGRAMME AND OUTCOMES	
4.1. The content and quality of the doctoral programme are aligned with internationally recognized standards.	**IN:** The overall body of research required for the PhD in this programme seems less extensive compared to international standards. While this may be explained by time and financial limitations, it clearly puts Croatian standards at a lower level in a European ranking. Candidates do acquire some transferable skills through courses and their research work (statistics, data analysis skills). This may be expanded at the cost of other taught course work, which is less viable economically. Admission procedures in place are transparent, and we believe are in practice adequate. Programme duration is comparable to European programmes. However, in contrast to the European system, the first (and partly second) year is dominated by theoretical courses, which effectively reduces the time spent on research. In that sense the programme itself does not fulfil the European QF of 3 years of full time or equivalent spent in independent research. In addition, there can be a considerable lead time until projects are accepted (late into second year of the programme). The panel acknowledges challenges faced by the faculty. Nevertheless, we have some concern that these points contribute to an overall reduction in the depth and/or breadth of original research (with contribution that is appropriate for the PhD level) that can be produced in this programme. Involvement of international examiners in the process of project selection and definition of milestones may

	help to elevate the PhD programme quality in the context of other HEIs across the EU.
4.2. Programme learning outcomes, as well as the learning outcomes of modules and subject units, are aligned with the level 8.2 of the CroQF. They clearly describe the competencies the candidates will develop during the doctoral programme, including the ethical requirements of doing research.	**IN:** We were encouraged by the range of compulsory and optional course content available, but in some cases there seemed to be an unduly high teaching resource. The panel noted this with concern and established a considerable strain on students. This was not mitigated by the time tabling which often clashed with their clinical work and required late night revisions. Moreover, the panel noted with some concern that the teaching load for staff members is considerable and too heavy, and curtailing hours and providing more focus would notably increase the time and hence quality of the taught courses and consequently the research work. Given the resource constraints, we wondered whether quite so much didactic teaching was necessary. Overall, the taught courses had clearly defined outcomes, but the ethic requirements were not always presented and/or justified.
4.3. Programme learning outcomes are logically and clearly connected with teaching contents, as well as the contents included in supervision and research.	**HQ:** Overall, the taught courses had clearly defined outcomes but see previous response. We also noted the existence of some taught modules with little or no bearing on the candidate's research topic making them less attractive and their content questionable for this programme. A regular review of the courses is proposed.
4.4. The doctoral programme ensures the achievement of learning outcomes and competencies aligned with the level 8.2 of the CroQF.	**IN:** The panel assessed whether the research outcome is equivalent in the context of EU requirements and self-formulated aims. This was based on: ● Sample theses provided: They appeared light in terms of data presentation and some contained only short results sections; ● Sample publications provided. These appeared of mixed quality from high to low impact and from substantial review of literature to brief

	communication of results*. ● No examples of seminar papers, conferences presentations were provided. It follows that the quality of PhD's is broad, with high and low performers (the latter being worrying). There is clearly the potential to improve the overall quality of the programme, and it is the suggestion of the panel, that stronger competition at entry (acceptance rate is about 40-50%) to pre-select high performing students and an audit of the quality of work from mentors/supervisors (introduce supervision assessment mechanisms) would be worthwhile in this context. This should be conducted regularly through a School internal review. *Also article form thesis should be evaluated with same academic rigour as the monograph.
4.5. Teaching methods (and ECTS, if applicable) are appropriate for level 8.2 of the CroQF and assure achievement of clearly defined learning outcomes.	**HQ:** We only superficially assessed this point. It was noted that the quality of teaching is perceived as satisfactory, but the teaching load both in terms of post-graduate and under-graduate teaching weight heavy on the shoulders of faculty and students. Some courses (generic skills, statistics, etc.) were highlighted as clearly enabling and supporting the research (see 4.6).
4.6. The programme enables acquisition of general (transferable) skills.	**HQ:** Soft and transferable skills (e.g., Ethics in Research, Writing Skills) are part of the elective courses of students. These are valued highly by candidates. However, the PhD programme could structure the teaching into 'must take' core courses and specialised modules that may be relevant for only a subset of candidates and be opted in for achievements of additional credits.
4.7. Teaching content is adapted to the needs of current and future research and candidates' training (individual course plans, generic skills etc.).	**IN:** The panel was concerned about two issues: • The overall requirement to fill up credits through taught courses; there is a considerable overload of taught courses in year 1 and 2, and the time slots

	often do not map with work commitments of candidates. This needs to be reviewed. As for the courses themselves, methods for training seem to be appropriate. • There was some suggestion that the programme existed primarily to support the needs of medical staff in Croatia, who require a PhD to take the most senior positions. Here in Split, an unmet need is the education in clinical research methodology and epidemiological as well as evidenced based medical inquiries. This may unnecessarily lay preference to local candidates and were the programme and the University to climb up international league tables, a more open approach 'without boarders' should be implemented.
4.8. The programme ensures quality through international connections and teacher and candidate mobility.	**IN:** The panel noted this as an area for considerable improvement (see also 4.7) based on: • There are few international collaborations that underpin the quality of research conducted in this institution, and supporting education and training of PhD candidates. This needs to be set up at a broader scale and become an integral part of the PhD programme (external assessors, examiners, …) • Few PhD theses were written in English – quality of language was not assessed. This should become an optional feature and students voting for this option should be positively rewarded for their choice (for example with a 'doctorus europaeus' etc.) • The PhD programme should encourage research visits to European countries (up to 1 month) without repercussions for the position at hospitals of the candidates. These study / research visits have become an integral part of European PhD programmes and are strong motivators for high quality research (and not proliferating the brain drain). • The programme should embrace a more European attitude and include occasional lectures from

	visiting scientists or visiting students, or other means to gain insight into global issues of health care research (round table discussions, mini workshops, etc.).

NOTE: RECOMMENDATIONS OF THE EXPERT PANEL TO THE ASHE'S ACCREDITATION COUNCIL AND QUALITY LABEL

The role of the Expert Panel in the re-accreditation of doctoral study programmes is manifold. The Expert Panel or part of the Expert Panel visiting a higher education institution drafts a report on the basis of a self-evaluation report, the accompanying relevant documentation, and a site visit to HEI. The draft report is adopted by all members of the Cluster Expert Panel, while the president of the Cluster Expert Panel is responsible for coordinating the assessment levels.

The report contains an assessment on whether a doctoral study programme delivered at a higher education institution complies with the prescribed laws and by-laws, as well as any additional/recommended requirements defined by the Agency's Accreditation Council, and whether a higher education institution can obtain a positive, i.e. satisfactory quality assessment according to the criteria set out in this document. Moreover, the Expert Panel must make recommendations for quality improvement.
Based on the assessment of all these elements, the Expert Panel may propose to the Accreditation Council of the Agency to issue either a confirmation on compliance, a letter of expectation for the period up to three (3) years in which period the higher education institution should eliminate the identified deficiencies, or to deny the license.

If the Expert Panel has assessed that a doctoral study programme delivered by a higher education institution does not meet legal and other requirements or that the quality of a study programme is not ensured (i.e. that HEI does not meet additional requirements or recommendations made by the Accreditation Council, or has a very poor quality assessment), they should propose to the Accreditation Council to deny the license.

If the Expert Panel considers that the relevant laws and bylaws have been met by a higher education institution, but that certain elements mentioned above do not meet the quality requirements, while they consider that the identified shortcomings can be corrected within a time frame of three years, they should issue a letter of expectation.

If the Expert Panel considers that all legal and additional/recommended requirements have been met and the quality assessment is satisfactory, i.e. that a study programme fulfils the learning outcomes appropriately defined for that level and scientific area, they may propose the issuance of a certificate and have a HEI commit to quality improvement and reporting to the Agency during the follow-up period.

Finally, if the Expert Panel has, in accordance with the criteria mentioned above, proposed issuing the certificate of compliance and assessed that, in addition to meeting the minimum quality requirements – i.e. the qualification framework level - for a study programme, the programme should be identified as a doctoral programme of a 'high level of quality', the Expert Panel may propose to the Agency's Accreditation Council that such a doctoral study programme be awarded the 'high quality label'. Thus the Agency, with the consent of the Accreditation Council, grants a higher education institution the right to use the label for their academic and promotional purposes.
The 'high quality label' cannot be proposed or awarded to a programme or a higher education institution that does not comply with the requirements laid down by the laws and bylaws mentioned

in this document, and any additional requirements recommended by the Accreditation Council. Moreover, the quality assessment awarded to a study programme should reflect a high level of quality inasmuch that at least half of the sub-criteria in each of the quality assessment criteria are assessed as being of high quality. The Accreditation Council of the Agency issues a final opinion on the label awarded. The content and form of the quality labels shall be prescribed by the Agency in a relevant general act.

The Accreditation Council of the Agency discusses the final report with all recommendations and suggestions, and issues their opinion on the report. Based on a prior opinion of the Accreditation Council, the Agency issues an Accreditation Recommendation to the minister responsible for science and higher education, and upon receipt of the minister's final decision on the outcome of the procedure, awards the 'high quality label" to a higher education institution.