

PhD program “Epidemiology & Clinical Research” at the University Hospital Essen

PhD-Programm „Epidemiology & Clinical Research“ am Universitätsklinikum Essen

Abstract

Since 2017, applicants with an academic degree in natural sciences or in the field of “life sciences” have the opportunity to participate in the three years international PhD program “Epidemiology & Clinical Research” at the University of Duisburg-Essen.

The PhD program consists of an accompanying program comprising 300 teaching units (one teaching unit of 45 minutes each) and the work on own research projects. The accompanying course program focuses on lectures and practical exercises in epidemiology, biostatistics, statistical analysis programs, medicine for non-physicians, and soft skills courses. The dissertation can be submitted as a monograph or as a compilation of three peer-reviewed publications (including at least two first authorships). Finally, the PhD program concludes with the successful defense of the dissertation.

Keywords: epidemiology education, clinical research, public health

Zusammenfassung

Seit 2017 besteht die Möglichkeit für Bewerber mit einem Abschluss in einem naturwissenschaftlichen Studiengang bzw. einem Studiengang aus dem Bereich der Lebenswissenschaften, an dem dreijährigen internationalen PhD-Programm „Epidemiology & Clinical Research“ an der Universität Duisburg-Essen teilzunehmen. Das PhD-Programm besteht aus einem 300 Unterrichtseinheiten (eine Unterrichtseinheit à 45 Minuten) umfassenden Begleitprogramm und der Tätigkeit an eigenen Forschungsprojekten. Schwerpunkte des Begleitprogramms sind u.a. Vorlesungen und Übungen in Epidemiologie, Biostatistik, statistische Analyseprogramme, Medizin für Nicht-Mediziner und Soft-Skills-Kursen. Die Dissertationsschrift kann als Monographie oder als Zusammenstellung von drei peer reviewed Publikationen (mindestens zwei Erstautorshipen) eingereicht werden. Das PhD-Programm schließt mit der erfolgreichen Verteidigung der Dissertation ab.

Schlüsselwörter: epidemiologische Ausbildung, klinische Forschung, Public Health

Introduction

Epidemiological research is of fundamental importance for the development of healthcare services and Public Health. To qualify young scientists in the field of epidemiology, various funding instruments have been implemented, including those of the Federal Ministry of Education and Research (BMBF) to ensure the qualification of young scientists in the field of epidemiology. The aim of the

“Directive for the Support of Health-Related Epidemiological Research at Universities” (announcement of the BMBF dated September 7th, 2010) is to strengthen epidemiological research in Germany by supporting sustainable profiling of the epidemiological departments at universities and promoting further education in this field [1]. The “Supporting Program for Clinical and Health Research of the Federal Government” (“Rahmenprogramm Gesundheitsforschung der Bundesregierung”) by the BMBF in-

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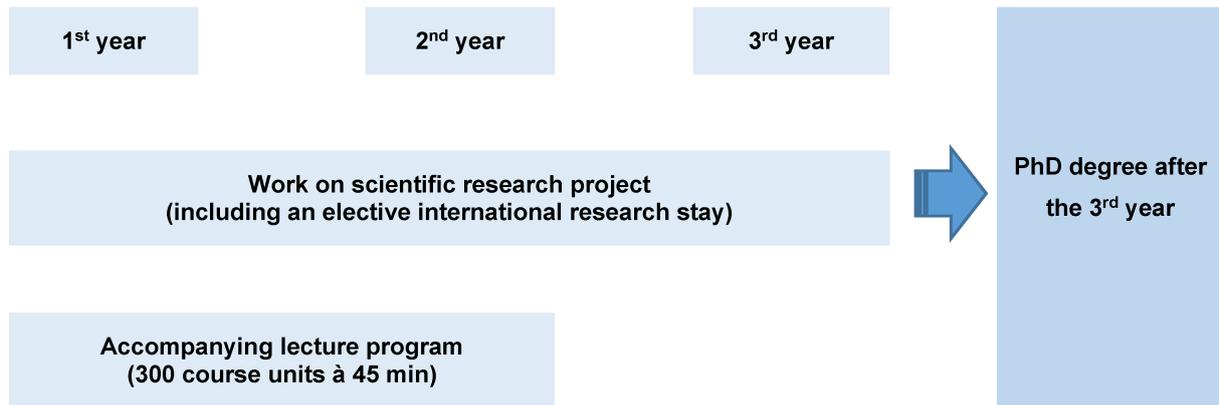


Figure 1: Structure of the PhD program „Epidemiology & Clinical Research“

tends to further strengthen epidemiological and Public Health research. The implementation of research results in humans requires above all clinically and scientifically active physicians. Therefore, the program described is simultaneously flanked by programs for clinical scientists. The support initiative of the German Research Foundation (DFG) promotes the establishment and expansion of these clinician scientists programs in university medicine [2]. Structured education programs and advanced training opportunities are designed to qualify physicians for top-level research. The DFG also supports the Clinician Scientist Academy (UMEA) at the University Hospital Essen. The PhD program "Epidemiology & Clinical Research" at the Institute of Medical Informatics, Biometry and Epidemiology (IMIBE) at the University Hospital Essen was established in 2017. The program implements the requirements of the BMBF framework program for Clinical and Health Research and thus contributes to the qualification of young scientists in epidemiology and clinical research.

Overview of the PhD program "Epidemiology & Clinical Research"

Aim and structure of the PhD program

The aim of the PhD program is to enable PhD candidates to plan, conduct, evaluate and publish their own epidemiological and clinical studies. The establishment of sustainable structures in the teaching of epidemiology and clinical research should support and encourage young scientists. Overall, the program consists of a three years doctoral phase with an integrated research project: During the first four semesters, a scientific accompanying program is offered (Figure 1), with two weeks of lectures per semester at the IMIBE. The 5th and 6th semesters of the program serve exclusively to complete the doctorate. The program is aimed at national and international students and the lectures are held in English. In addition, each PhD student is supported by two advisors. Suitable first supervisors are professors, junior professors and habilitated members of the Medical Faculty of the University of Duisburg-Essen. Professors, junior professors and

habilitated scientists from other universities and research institutions can take on secondary supervision. After the successful completion of the dissertation, the Medical Faculty of the University Duisburg-Essen awards the academic degree "Doctor of Philosophy (PhD)". Persons holding the degree „PhD“ may either use this title at the end of their name or use the abbreviated form "Dr." before their name.

Legal and admission requirements for the PhD program and involved institutions

The legal requirements for the PhD program as well as the admission requirements are listed in the PhD regulation of the Medical Faculty of the University Duisburg-Essen dated September 27th, 2016. Attachment 4.1 of the PhD regulation contains the regulatory statutes for the PhD program [3]. This PhD program is aimed at applicants who have completed a scientific course of study, particularly in the "life sciences", including e.g. medicine, dentistry, veterinary medicine, epidemiology, biostatistics, public health, biology, chemistry, physics, biochemistry, pharmacology, psychology, mathematics, statistics, computer science, food and nutrition science, sociology and sports science. Furthermore, the admission to the PhD program also depends on the cumulative number of ECTS and the final grade from previous studies. The PhD program starts each year in April for the summer semester.

The IMIBE of the University Hospital Essen, the Institute for Prevention and Occupational Medicine of the German Social Accident Insurance (DGUV), Institute of the Ruhr University Bochum (IPA) and the Faculty of Statistics, TU Dortmund University are involved in the content of the program. The program director is Prof. Dr. med. Andreas Stang, MPH of the IMIBE at the University Hospital Essen, who runs the program within the Ruhr Alliance together with Prof. Dr. med. Thomas Behrens (affiliation) and Prof. Dr. Katja Ickstadt (affiliation).

Table 1: Contents of the PhD program “Epidemiology and Clinical Research”

Module	Number of course units
Epidemiology	100
Biostatistics	40
Statistical analysis programs	40
Medicine for non-physicians	20
Compulsory modules (GEP, GCP, scientific citation)	4
RUHR School of Modern Epidemiology (3-day course)	35
Scientific/academic capability*	26
Elective modules	35

* includes scientific writing, conduct of a teaching unit, poster creation and poster presentation, preparation of research proposals etc.

Contents of the PhD program and evaluation

The PhD program, unique in Germany, combines two main research approaches: epidemiology and clinical research, and is therefore not only interesting for scientists of the “life sciences” but also for physicians. The program comprises 300 course units of 45 minutes each. Participation in the core modules epidemiology, biostatistics, statistical analysis programs, medicine for non-physicians, compulsory modules on scientific competence (Good Epidemiological Practice [GEP], Good Clinical Practice [GCP], scientific citation, scientific writing) and participation in the RUHR School of Modern Epidemiology is mandatory [4]. On the other hand, further modules of the entire module catalogue of the Ruhr Universities of Duisburg-Essen, Bochum and Dortmund (Ruhr Alliance) can be freely chosen according to the personal research interests of the students (Table 1). More information about the PhD program is available at <https://www.uk-essen.de/zke/phd-programm/>.

Further contents of the PhD program are three project presentations and the participation in the “Day of Research” at the University Hospital Essen with the opportunity to present the results of the research projects carried out. In addition, participation in scientific presentations at national or international scientific conferences can also be credited to the elective modules of the PhD program.

After each semester, each module of the doctoral program “Epidemiology and Clinical Research” is evaluated by the students. This evaluation comprises 15 questions on the quality of structure, processes and results. The PhD students can indicate what they liked in the lecture and exercises or what needs to be improved. In the teaching conference the results of the evaluation are discussed with the participation of the lecturers and the student representatives. The identified potential for improvement will be implemented in the following semesters. The conception of the modules, the working materials, the working atmosphere and the overall assessment of the course are rated by the students as good to very good. Questions concerning previous knowledge, interest in the

course topic and the relevance of the course for the students own studies are usually heterogeneously. In particular, students are interested in practical exercises; especially evaluations with SAS proved to be highly demanded. The RUHR School of Modern Epidemiology [4] is a core element of the PhD program which, like all modules of the PhD program, is open to external guests. Once a year the RUHR School covers important and current topics in epidemiology with international guest lecturers. In addition to imparting and expanding knowledge about epidemiological and clinical research methods, it offers doctoral students the opportunity to establish interdisciplinary and international networks. International research stays of students during their PhD program can be arranged and recognized as academic achievement for the implementation of the program (Figure 2).

Funding and costs of the PhD program

Most applicants need to provide private funding, however, the IMIBE occasionally offers PhD scholarships for specific research topics. Part-time work is possible during the PhD program, in contrast, full-time employment is hardly compatible with the completing of the PhD program. The University of Duisburg-Essen requires all students of the PhD program to pay the student body and social contribution (winter semester 2019/20 – 313 € in total). This includes tickets for the public transport bus, tram and regional trains in North Rhine-Westphalia as well as the social contribution for student services and student self-administration (“Sozialbeitrag”).

PhD applicants of the period 2017–2019

In the application period from 2017–2019, a total of 90 applicants was interested in the PhD program. Of the 34 applications from Germany, 20 came from North Rhine-Westphalia, four from Bavaria and three from Hesse. Overall, six male and eleven female PhD students enrolled in the program. Eleven of the 17 PhD students came from Germany, three from other European countries, two from Africa and one from Asia. The accepted



Figure 2: Participants of the RUHR School of Modern Epidemiology 2019 (Lecturer Prof. Jay S. Kaufman, McGill University, Canada and PhD program director Prof. Dr. med. Andreas Stang, MPH)

applicants have previously obtained various academic degrees, e.g. in medicine, veterinary medicine, statistics, pharmacology, chemistry, sociology, and psychology.

Discussion

The PhD program at the University Hospital Essen is one of three epidemiological PhD programs in Germany. In addition to the University of Duisburg-Essen, the Ludwig-Maximilians-Universität Munich (“Medical Research in Epidemiology & Public Health”) and the HZI Helmholtz Center for Infection Research Braunschweig (“Epidemiology”) offer PhD programs in epidemiology. In Essen, the focus of the PhD program is on training the epidemiological and clinical research methods. The network between the faculties and universities of the Ruhr Alliance, an association of the universities of Duisburg-Essen, Dortmund and Bochum, enables synergies that offer PhD students a wide range of training opportunities. Existing collaborations with national and international universities and research institutions such as Boston University, the University of North Carolina, Chapel Hill, Harvard University and the Karolinska Institutet will be further expanded and new collaborations established.

Clinically and scientifically active physicians can obtain epidemiological and biostatistical qualifications through the DFG-funded Clinician Scientist Academy (UMEA) within the framework of the PhD program Epidemiology & Clinical Research. The qualification of young medical scientists is thus promoted. In addition, interested stu-

dents, physicians and scientists can also attend individual modules of the PhD program.

A study on the Swiss national MD-PhD program supports the view that MD-PhD graduates are well qualified for a successful career in academic medicine [5]. Participants in the PhD program benefit from the heterogeneity of their respective vocational training and education, their different nationalities, the educational concept including the research projects, and the lecture and practice weeks in the first two years of the program.

Conclusion

The PhD program “Epidemiology & Clinical Research” at the University Hospital Essen offers a unique opportunity to qualify researchers in epidemiology and clinical research in Germany. The link between the PhD program and the clinician scientist program enables physicians to receive further training in epidemiological and clinical research methods. The acquisition of a PhD degree should not only facilitate the academic career of graduates, but also enable them to take up leading positions in health science or clinical research institutions. Due to the international recognition of the PhD degree, graduates should also have a greater advantage on the international job market.

The long-term goal of the program is to establish DFG-funded international research training group in order to make the program even more attractive and to be able to offer a larger number of scholarships.

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