Doctoral Degree (Ph.D.) Program
Department of Epidemiology of Microbial Diseases (EMD)
Public Health (PH) Ph.D. Program

The Ph.D. program in Public Health (PH) is administered through the Yale Graduate School of Arts and Sciences. The Graduate School makes the final decision on accepting students into the program, admission to candidacy, and the awarding of the degree. Dr. Christian Tschudi is the Director of Graduate Studies (DGS) of the PH doctoral program and also the EMD representatives to the PH Graduate Studies Executive Committee. Melanie Elliot serves as the coordinator of PH graduate student affairs. Epidemiology of Microbial Diseases (EMD) is one of five Departments in the Public Health program offering studies toward a Ph.D. degree and the EMD departmental requirements are outlined in this document.

PROGRAM OF STUDY

The goals of doctoral training in EMD are to provide a current theoretical and practical base of epidemiological and microbiological principles, to master research methods, and to apply these skills to investigations of the biology of infectious organisms of public health importance and the epidemiology of the diseases they cause. The approach is multidisciplinary and includes ecological, epidemiologic, mathematical modeling, pathogenic, clinical, cellular, immunologic and molecular aspects of infectious diseases, their causative agents, vertebrate hosts, and vectors.

The main component of the graduate program is the successful completion of original dissertation research and the preparation of a written dissertation. However, each student must also fulfill a number of additional requirements. Preceding the start of full-time dissertation research, each student must successfully complete 7 courses (excluding the required research rotations and the ethics course), carry out research rotations with three separate faculty members [EMD 670a and b; students register for EMD 670a in the fall semester of both their first and second year] and pass the Qualifying Examination.
1. Academic Advising
   Each student is assigned an academic adviser at the time of matriculation. The academic adviser is available for help with general academic questions, course selections and research rotations. The dissertation advisor is chosen by the end of the third semester, or earlier, and may or may not be the original academic advisor. **The academic and dissertation advisor must have an appointment in the Graduate School.** Once a dissertation advisor is selected, the student can start preparing for the Qualifying Exam.

2. Required Course Work
   A. *Formal Graduate Level Courses*
      Since students in the EMD Ph.D. program have widely varying backgrounds and interests, there is no specific set of course requirements. Each student plans, with guidance from the academic adviser, a program tailored to the individual needs and career goals. A program of course work will most often include biostatistics, epidemiology, microbiology, as well as complementary courses offered in other departments of the University.
      
      The EMD Department requires that each student passes at least 7 graduate level semester courses (excluding the required three research rotations and the ethics course). Students are required to complete course work in epidemiology (EMD 508a or CDE 516b). In addition, students must complete coursework that introduces them to the breadth of public health (EPH 608, Frontiers in Public Health). Students entering the program with an MPH are exempt from EPH 608, Frontiers in Public Health. Students with prior graduate level epidemiology courses may be exempt from coursework in epidemiology.
      
      The Graduate School requires that Ph.D. students achieve the grade of Honors in at least one full-year or two full-term graduate courses. Additionally, students in the PH program must have an overall High Pass average. The course selections are approved by the academic advisor and the DGS.

   B. *Research Conduct*
      In the first year all students are required to take a course on scientific conduct, such as EPH 600b, Research Ethics and Responsibilities. This course does not count toward meeting the 7-course requirement and will be graded as satisfactory or unsatisfactory.

3. Research Rotations
   All students are required to do three research rotations, each with a different principal investigator. The third rotation is normally taken in the summer after the first year. Prior to registration for each semester, the student should provide the EMD representatives to the PH Graduate Studies Executive Committee (C. Tschudi) with the name of their faculty sponsor and a brief description of the planned rotation project (one-page maximum).
      
      At the end of the rotation, the faculty sponsor provides the EMD representatives to the PH Graduate Studies Executive Committee (C. Tschudi) with a brief written evaluation and a letter grade (e-mail will suffice). There will be short presentations at the end of each rotation. All first year students and the EMD representatives to the PH Graduate Studies
Executive Committee will attend the talks. Rotation sponsors, rotation lab members, EMD doctoral students and EMD faculty will be invited. Rotation students will prepare a 15-minute talk consisting of a short introduction, project aims, results and conclusions. A total of 7-8 slides are recommended. Students will also provide the EMD representatives to the PH Graduate Studies Executive Committee with a 1-2 page written summary of their research rotation.

4. Teaching Requirements
During the second and third year, students are required to serve as teaching fellows each term (10 hours/week). With the approval of the DGS, graduate research assistantship opportunities may take the place of teaching in the third year. Other exceptions may be granted in year three, with the approval of the DGS, if the student has served as a Teaching Fellow both terms of their second year. Students are not paid for this requirement in addition to their stipend.

5. Qualifying Examination
A general oral and written qualifying examination, "separate from course examinations", must be passed by the student as required by the Graduate School. The Qualifying Examination serves as an opportunity for the faculty to evaluate students en route to their admission to candidacy for the Ph.D. degree. It also serves as a valuable learning experience, where a student has a chance to read critically and in-depth with various faculty members on both the thesis topic and two other topics of interest to the student.

The Qualifying Examination is normally taken during the spring semester of a student's second year, but should be completed before he or she registers for the fifth semester. Students must have completed all course requirements and must have selected a dissertation advisor before taking the Qualifying Examination. Thus, the student should meet with his or her dissertation adviser no later than the third term of study in order to decide on an area of focus in preparation for the qualifying examination and in order to define the research area for his or her dissertation.

A possible timeline for the exam:
4 to 6 weeks before a student plans to begin the reading period she or he should consult with her or his thesis advisor and the EMD representative to the PH Graduate Studies Executive Committee about possible topics and discuss with them the composition of the examination committee. This committee is composed of three members; at least two are expected to be YSPH faculty. The examining committee will not include the student's dissertation advisor, but the advisor is able to serve as an informal resource for choosing reading topics. Once the topics and committee members are approved by the EMD representative to the PH Graduate Studies Executive Committee, the student contacts the prospective committee members.

At least one week in advance of the proposed start of the reading period, the student arranges a pre-examination meeting with the committee members and the dissertation
advisor. For this, the student prepares a brief summary (one page total), describing the
dissertation topic and potential reading topics. The purpose of this meeting is to finalize the
reading topics and to schedule a date and time for the oral examination.

4 weeks of reading with faculty (one hour per week with each).

2 weeks to prepare the research proposal on the dissertation topic.

Oral examination within 10 days of handing in the proposals to the committee members.

Reading Period (4 weeks)
One of the reading topics must be on the proposed dissertation topic, while the other
two should ideally be in areas which will expand the dissertation topic to subject matters not
covered in courses. The reading period should not exceed 4 weeks, although this can be
expanded to fit individual readers’ schedules. Usually, the student will meet for one hour per
week with each faculty reader to discuss and critically evaluate specific scientific papers,
and to agree on the next week’s reading material. Students and faculty should concentrate
on original papers, but faculty should advise the student on appropriate background
reading, including reviews and methods papers.

Writing Period (2 weeks)
At the end of the writing period, the student will hand in a research proposal on the
dissertation topic. Although two weeks are allocated for the writing period, work on the
proposal can start any time during the reading period. The proposal has a fifteen-page limit
and should concisely review the pertinent background information, logically and clearly state
the questions being attacked, and lay out an experimental plan according to the outline
below. The Specific Aims and Research Strategy must be double-spaced and use a font of
no less than 12 points. It’s very important that you present your proposal in a clear and
logical fashion. The committee will judge it on the basis of logic, feasibility and originality.
The student may consult the dissertation advisor, committee members, other faculty
members, postdocs and students about technical aspects of the proposal.

The following format must be used (similar to NIH guidelines):

1. **Specific Aims (1 page or less):** A self-contained description of the project, which
   should be informative to other persons working in the same or related fields. State
   concisely the goals of the proposed research and summarize the expected
   outcome(s), including the impact that the results of the proposed research will exert
   on the research field(s) involved.

2. **Research Strategy:** Use the following subsections:
   (a) **Significance**
This section should place the research project in context and describe the proposed research in a manner intelligible to a non-specialist. This should include a brief, but critical, evaluation of the relevant literature and a description of how the proposed research project will advance scientific knowledge and/or technical capability in one or more broad fields.

(b) Innovation
Explain how the proposal challenges and seeks to shift current research paradigm(s). Describe any novel theoretical concepts, approaches or methodologies, instrumentation or interventions to be developed or used, and any advantage(s) over existing methodologies, instrumentation, or interventions.

(c) Approach
Outline the research project envisioned at this time and sketch out the plan to attain the overall goals of the project. Describe the overall strategy, methodology, and analyses to be used. Include preliminary data, if available. Acknowledge pitfalls and limitations of the research, and if possible suggest alternative strategies.

3. References and Figures: Abbreviated citations to relevant literature should be included in the text, and full citations gathered in a bibliography at the end of the proposal. These should be pertinent and need not be an exhaustive list. If necessary, up to two pages of diagrams, figures and/or tables can be included. These two pages and the bibliography are excluded from the fifteen-page limit.

Oral Examination
This final part of the process should be held within 10 days of finishing the writing period, but enough time (at least 1 week) should be allowed between the end of the writing period and the oral examination for the committee members to read and evaluate the proposal.

The student will prepare a short talk for the proposal, preferably with visual aids. The presentation should be planned to last about 15 minutes, although the actual presentation will usually take longer, since faculty are likely to interrupt with questions. The committee can also ask questions on material covered during the reading period.

The dissertation advisor may be present during the examination as an observer, but not as a participant. Before the oral examination, the dissertation advisor must submit to the exam committee chair a brief written evaluation of the student's progress in the dissertation research.

Evaluation
On the basis of the student's performance, the examination committee decides whether the student should: (a) pass unconditionally, (b) pass conditionally, with further study suggested (or required) in one or more areas, or (c) fail, with or without the option to re-take
the examination after the areas of concern have been pointed out and the student has had time to prepare. If a student receives an unconditional pass, the committee should note whether it is an unconditional pass with distinction or not. Following the oral examination, the committee will meet with the student to transmit its decision and specific advice. The decision of the examination committee needs to be communicated in writing (e-mail will suffice) to the EMD representatives to the PH Graduate Studies Executive Committee and the DGS.

6. Dissertation Research

Dissertation Advisor

Although students and potential dissertation advisers are encouraged to discuss possibilities at any time, a final commitment must be made by the end of the third term. The dissertation advisor must have an appointment in the Graduate School, but does not necessarily have to be in YSPH.

Dissertation Advisory Committee

The Dissertation Advisory Committee (DAC) usually consists of three members. Two members are expected to be YSPH faculty, one member may be from another department and the dissertation advisor serves as the chair of the DAC. An additional committee member may be selected from outside the University, if she/he is a recognized authority in the area of the dissertation. Faculties who supervised research rotations and/or served on the qualifying examination committee are often appropriate choices. The DAC is expected to meet at least twice each year, and more frequently if necessary. Since Dissertation Progress Reports are due at the close of the spring term, it is advised that one meeting is scheduled during this term. The student schedules meetings of the DAC. The Chairperson of the DAC produces a summary evaluation of progress and plans for the coming year. This document is to be distributed to each committee member for comments and signature. The student and the DGS are to receive a copy of the signed document from the DAC Chairperson.

Dissertation Prospectus

By June 30th of the third year at the latest, each student prepares a dissertation prospectus outlining the research proposed for the Ph.D. The DAC reviews and approves the prospectus and the student submits the prospectus to the DGS and the PH Graduate Studies Executive Committee for final approval.

Readers of the Dissertation

After approval of the prospectus the DAC reviews the progress of the dissertation research and the dissertation and decides when it is ready to be submitted to the readers. This decision is made based on a closed defense of the dissertation, which involves a formal oral presentation to the DAC and other invited faculty. Upon completion of the closed defense, the chair of the DAC submits its recommendation to the DGS and the PH
Graduate Studies Executive Committee, together with the recommendation of suitable readers. A minimum of three readers are proposed by the student and the dissertation advisor, one of whom is at YSPH, the second reader can be from YSPH or another Yale department. Both readers must hold a Graduate School appointment and should include at least one senior faculty member. The third reader must be from outside the University. However, readers cannot be members of the Dissertation Advisory Committee. The PH Graduate Studies Executive Committee reviews the proposed readers and approves a final list.

*Oral Presentation of the Dissertation*

Doctoral dissertations in PH must be presented in a public seminar. This presentation is scheduled after the submission of the dissertation to the readers and preferably prior to the receipt and consideration of the readers’ reports. At least one member of the DAC supervising the dissertation and at least one member of the PH Graduate Studies Executive Committee are expected to attend the presentation.

**7. Master’s Degrees**

*M.S.* This degree is normally granted only to students who are withdrawing from the Ph.D. program. Students in EMD must have successfully completed (prior to withdrawal) at least ten courses in the doctoral program and a capstone experience, achieving a minimum of two Honors grade and an overall HP average.

*M.Phil. (en route to Ph.D.)* All Ph.D. requirements are met except dissertation.