Overview of Doctoral Study in the PhD/DrPH Program

Guidelines for Doctoral Study

Study towards completion of a doctoral dissertation in the Epidemiology Department is accomplished through the completion of didactic coursework, guided independent study, and completion of a dissertation. Despite required coursework, the focus of doctoral training places a heavier emphasis on the dissertation and the development of independent skills in research and/or practice.

Students typically begin study in the doctoral program with 1-2 years of focus on the completion of major elements of coursework. At this time, students, in consultation with their primary advisor, can also begin discussions on research/practice interests and goals that may be pursued in a dissertation proposal. Students also may become engaged in faculty research projects.

Upon completion of the primary coursework requirements, students (in consultation with their primary advisor) should look to register and complete the Preliminary Qualifying Exams.

Preliminary exams (UPDATED FOR AUGUST 2021 EXAM ADMINISTRATION)

The Preliminary Qualifying Exams are the first of four milestones that must be completed successfully in the doctoral program. The qualifying exams consist of three written exams: General Epidemiology, Biostatistics and Applied Epidemiology. The General Epidemiology Exam is a 3-hour in-class closed-book exam. The Biostatistics Exam is a 5-hour open-book and open-note exam that is typically administered and proctored in a computer laboratory. The Applied Epidemiology Exam is a 4-hour closed-book exam that is typically administered and proctored in a computer laboratory. Due to the ongoing COVID-19 pandemic, all three exams will be remotely administered and proctored in 2021. Students will receive information regarding remotely administration to be conducted via Canvas and Zoom. Collectively, the exams are designed to assess a student's ability to demonstrate and apply fundamental principles of epidemiology and biostatistics, to think critically about epidemiologic methods and reasoning and to synthesize epidemiology and biostatistics concepts as applied in a research proposal. This evaluation is used to identify students with the potential to complete doctoral research successfully, and to also reveal areas of weakness in the student's preparation.

The Preliminary Exams are offered in August of each year between the summer and fall terms. This year they will be offered during the week of Monday, August 9 – Friday, August 13, 2021. To register for the exam, students must request permission from their adviser, who is then asked to email the Committee Chair, Dr. Catherine Haggerty (haggerty@pitt.edu), by May 31, 2021 for approval and confirmation.

At the time of the exam, students must be an accepted and enrolled PhD or DrPH student and be registered for classes in GSPH. Students should have completed the following courses (or the equivalent courses at another university):

EPIDEM 2110: Principles of Epidemiology
EPIDEM 2180: Epidemiology Methods 1
BIOST 2041: Introduction to Statistical Methods
BIOST 2049: Applied Regression Analysis

Additional courses are not required, but students who have completed the following have performed better on the exams than those who did not:

EPIDEM 2183: Reading, Analyzing and Interpreting Public Health Medical Literature
EPIDEM 2181: Design and Conduct of Clinical Trials
Any course that involves critiquing epidemiologic literature

Students must pass each of the three exams (described below) with a score of 75% or higher within two attempts. Students taking the exams for the first time must take all three exams during the one-week testing period. Students who do not pass all three exams are required to retake the exam(s) that they did not pass.

Arrival/extra 30 minutes: The exams are scheduled for 30 minutes longer than the test taking time in case of a late start or disruption (e.g., due to a fire alarm). However, adjustments to the time will be made if needed for the group, and not on an individual basis. Please arrive at 12:00 pm to ensure that you start the exam with the group.

During the exam: Food and drinks are allowed during the exams as long as related noise does not disrupt other students.

Exam results: Each student and their advisor will receive a personal email with their exam results. Results for each exam will be released as grading is completed. General Epidemiology and Biostatistics Exam grades will be released approximately two to three weeks after the administration of the Preliminary Exams. The Applied Epidemiology grades will be released approximately three to four weeks after administration. Students who fail one or more of the exams will be invited to set up a meeting(s) to go over their results.

General Epidemiology Exam: This exam is a 3-hour in-class closed-book exam that consists of 55 to 60 short answer and multiple choice questions. The exam will be given on Monday, August 9, 2021 from 12:30 pm to 3:30 pm via Canvas and Zoom. Please log on at 12:00 pm. Students may bring one piece of 8.5" x 11" paper of hand written or typed notes (front and back) that contains any formulas, definitions or other applicable information. Students are also permitted to use a stand-alone calculator, but cannot use any device with cellular or internet capabilities (i.e. smart phone, tablet, laptop) for calculating answers or referencing material. In preparation for this exam, students should review the Gordis and Szklo textbooks, including practice problems, and all of the material, including homework problems, from EPIDEM 2110 and EPIDEM 2180 or equivalent courses (see course descriptions for more details). Electronic copies of recommended textbooks (no purchase required) may be accessed via the Health Sciences Library website: http://www.hsls.pitt.edu/resources/books/ebooks?s=Epidemiology; E-books: Epidemiology | HSLS (pitt.edu)

Gordis, Leon. Epidemiology, Fifth Edition. Elsevier Saunders, 2014. Elsevier/Saunders Company (ISBN: 978-1-4557-3733-8). Available as an electronic book (no purchase required) at the Health Sciences Library website
Szklo, Moyses and Nieto, F. Javier. Epidemiology: Beyond the Basics, Third Edition, Jones and Bartlett, Boston, MA, 2014. (ISBN-10: 1449604692)
In particular, review the following:

Best practices, appropriate application, limitations and strengths of each study design, as well as the appropriate measures of disease occurrence and statistical methods to apply:
Case-Series
Case-control study
Case-cohort study
Ecological study
Cross-sectional study
Retrospective cohort study
Prospective cohort study
Nested case-control study

Randomized clinical trial
Best practices, appropriate application, calculation, interpretation and the pros and cons of various types of measures:
Incidence
Prevalence
Person-time
Odds ratio
Relative risk
Absolute vs. relative differences
Attributable risk/rate
Population attributable risk
Correlation coefficient
Adjusted rates
Specific rates (e.g., case fatality, infant mortality)
Direct/indirect adjustment
Lifetable
Sensitivity
Specificity
Positive/negative predictive value
Intraclass correlation coefficient (ICC)/Kappa statistic
Interaction (Additive vs Multiplicative)
Best practices, appropriate application, interpretation and strengths and limitations of research methods:
Measurement error
Validity
Reliability
Study design approaches to minimize bias and confounding
Missing data (participation rate, response rate, completion rate)
Intention to treat in RCTs
Measurement approaches (surveillance, existing data, self-report, interview, direct physiologic measures, subjective, objective)
Best practices, appropriate application and interpretation of data analysis:
Parameter estimates
Confidence interval
P-value
Effect size/Delta (Δ)
Standard error (stderr)
Statistical test assumptions
Linear regression
Logistic regression
Survival analysis
Cox-Proportional Hazards Kaplan-Meier

Best practices, appropriate application and the strengths and limitations of interpreting research results:

Type I error/Alpha (α)
Type II error/Beta (β)
Power
Internal validity
External validity
Regression to the mean
Random error/Precision
Mediators
Age, period, cohort effects
Bias: Recognize types of bias, how to assess, direction of effects
Confounding: Recognize and assess, direction of effect, residual confounding

Effect modification/interaction: Recognize and assess, direction of effect, manner of interaction (additive/multiplicative), homogeneity vs. heterogeneity of effects
Causal Inference approaches
Counterfactual outcomes / potential outcomes
Identifiability conditions required for estimation of a causal effect including Exchangeability, Consistency / Well-defined intervention, and Positivity
Directed acyclic graphs (DAGs) including representing confounding and selection bias

Best practices, appropriate application of big picture interpretation of research findings:

Causal inference
Statistical inference
Hill's causal criteria
Systematic reviews
Rothman's causality models
Meta-analysis
Sources of heterogeneity
Publication bias
Cross-level inference/Ecological fallacy

Biostatistics Exam: This exam is a 5-hour open-book and open-note exam that will be given on Tuesday, August 10, 2021 from 12:30 pm to 5:30 pm via Canvas and Zoom. Please log on at 12:00 pm. For the remote exam, students can use notes, books and a thumb drive with electronic material that has been prepared. In addition to class notes, students are encouraged to use electronic information that they have prepared in advance for the exam, including for example, electronic notes and sample baseline table shells or program language for running regression models. Students may access software documentation (e.g. SAS or R help documentation that is built into the software). The use of Stack Exchange or other web-forum sites is not permitted. The use of any cellular services or the internet to look up information during the exam is prohibited. Students are permitted to use Microsoft Word and statistical programming software.

The exam will involve the analysis of one dataset. The content of the questions will be based on material taught in BIOS 2041 and BIOS 2049. NOTE: Starting in 2021, the Biostatistics Preliminary Exam will be modified to parallel current BIOSTAT 2041 and 2049 content and competencies focused on creating, understanding and interpreting statistical output. As compared to prior preliminary exam years, there will be less need for hand calculations using formulas.
Information about an applied research question and a related dataset will be provided. Questions on the exam will be related to the dataset and this research question. Some questions will require students to write statistical programs using software such as Stata, R or SAS, produce output. Other questions will involve the interpretation of their findings. Student's ability to conceptualize and implement analyses pertinent to quantitative research is tested. Students must know the basics of the common distributions (e.g., binomial, chi-square, F, Poisson, Normal, t), the assumptions and the null hypotheses for the statistical tests listed below so they can select the appropriate tests. Students should be able to interpret the parameter estimates and statistical tests that they produce.
Statistical methods covered on previous exams include:
Chi-squared tests
goodness of fit
independence
homogeneity
One and two-sample z-tests
One and two sample t-tests (pooled and unequal variance)
Paired t-test
Nonparametric tests

Wilcoxon rank-sum test (AKA Mann-Whitney U test)
Sign test
Wilcoxon signed-rank test
Correlation, Simple and Multiple Linear Regression
Correlation
Simple Linear Regression
Multiple Regression
One Way Analysis of Variance (ANOVA)
Overall F-test
Specific group comparisons and multiple comparisons procedures
Two-way ANOVA
Test for main effects and interaction effect
Analysis of Discrete Data
Odds Ratio, Relative Risks, Rate Ratio
Simple and multiple Logistic Regression
Simple and multiple Log-Linear Regression for counts and rates
Methods for Time to Event Data
Life-table and Kaplan-Meier Techniques
Log rank and Wilcoxon tests
Sample Size and Power
Estimating a mean
Estimating a proportion

Applied Epidemiology Exam: This exam is a 4-hour closed-book exam that will be given on Friday, August 13, 2021 from 12:30 pm to 4:30 pm via Canvas and Zoom. Please log on at 12:00 pm. Electronic notes are not permitted and students cannot use any cellular or internet services for referencing material. Students may utilize Microsoft Word to complete the exam. Students will receive a published scientific article 48 hours prior to the exam. Students may use any resources available to understand the article and its methods, but are not permitted to talk to other students, faculty or other individuals about the article.

During the exam, students are asked to critique aspects of this article, interpret results, discuss potential biases and reflect on public health implications related to the topic. Students are also asked questions regarding how they would design a study to answer a similar research question (i.e., address the association between the exposure and outcome). All answers must include the appropriate level of specificity needed to interpret if the comprehension of the concept is correct.

These questions may include but are not necessarily limited to:

Part 1: Critique of the article (example questions):
Strengths and weaknesses of the design of the study
Potential advantages and disadvantages of data collection methods
and recruitment strategy
Biases associated with exposure assessment
Adequacy of the analytical plan and control for confounders
Public health significance
Novelty and innovation
Adequacy of analytical plan and control for confounders
Limitations of the proposed study

Part 2: Application to a new approach to design a study (example questions):
Proposal to study the research question: alternate design
Strengths and limitations of proposed study
Assessment of exposure(s) and outcome(s)
Sample size determination based on new study design (includes a requirement of a sample size/power calculation)

Feasibility of carrying out this design with the sample you estimated would be required

Applied Epidemiology Exam frequently asked questions:

Q: How should I study for the Applied Exam?
A: Review guides of how to critique an article and class examples from Drs. King and Rosso's Reading and Analyzing Literature course.

Q: How can I prepare after receiving the article for the exam?
A: Allow yourself substantial time to read and prepare responses for potential questions on the critique and study design for the exam. For Part I preparation, critique the article using guides from Drs. King and Rosso's class and including a critique of all components listed for Part I on the Applied Exam guide. Familiarize yourself with the methods if you are not familiar with these, particularly for exposure and outcome assessment and statistics. For Part II preparation, plan a study design which will advance the field of research in a novel way including details of all components listed for Part II on the Applied Exam guide.

Q: How should time be budgeted during the exam?
A: If you are unsure of a Part I question, answer briefly and return to it if time permits so that you allow adequate time for the Part II study design section. Set a time at which you will move onto Part II so that you do not run out of time.

Q: What are issues that the Committee has noted from past exams?
A: Any answer that does not have clarity and specificity of a response to determine comprehension of the concept cannot receive full credit. Make sure your answer reflects a response to the primary question that was asked on the exam, rather than a lot of extraneous information. Do not rush through Part II. If you leave out parts of answers then you cannot receive full credit for these questions.

Q: How many points are needed to pass and how many points are on each part? How is a fail determined?
A: A passing score is 75%. Each blinded exam is assigned 2 graders from the Committee, with a 3rd grader assigned if a score is a borderline fail/pass. The Committee discusses failed exams to ensure continuity of grading across graders and to establish an overall agreement for why points were lost. If an exam is failed, a fail report will be issued outlining concepts that were missed.

Q: Is information from other resources able to be used to calculate sample size if the original article didn't provide needed numbers?
A: You may use information from resources other than the article that we provide to estimate the sample size for your proposed study. However, the primary rationale and justification of your study design must be based on the article provided for the exam and should not be based on any other resources.

The dissertation proposal

Upon successful completion of the preliminary qualifying exams, students may formally begin to work on a dissertation proposal. This work will begin in consultation with the primary faculty advisor and the identification of an appropriate dissertation topic.

The dissertation is a written document that presents the results of a research project carried out by the student. An appropriate research project involves a substantive piece of original and independent research grounded in an appropriate body of literature. For the DrPH, the research project should be relevant to an identifiable component of epidemiology in public health as it is currently practiced. All dissertation projects should present a hypothesis tested by data and analysis and provide a significant contribution or advancement in the chosen area of study.

A good dissertation provides the student with an area of concentration that is the “spring board” for their career. The dissertation should advance knowledge and answer one or more important questions, but it should also raise more questions, thus providing the impetus for further research. A good dissertation ties together didactic coursework and allows the student to see how research is accomplished. The dissertation is an important step in training the student to ask good questions as well as learning how to go about answering them. If the process works as it should, the committee learns from the experience as well as the trainee.

Dissertation formats

Students may identify and prepare a dissertation proposal following one of two formats:

Traditional Format: In the traditional format, students prepare a dissertation proposal to describe the background, methods, results, and interpretation of one research project. The written dissertation document should include an introduction, a meaningful literature review, a clear presentation of the methods and results of the project, and an appropriate discussion of the meaning of the results.

The introduction of the dissertation should outline the public health significance of the topic area under investigation in the dissertation, and identify the key research objectives. A meaningful literature review should identify the historical context for the dissertation research project, an analysis and synthesis of a broad literature base, and the summation of existing knowledge and areas of research opportunity in the chosen field of study. A clear presentation of the methods should identify the chosen study design, study population, methods for key research variables, and proposed methods of analysis. The results should outline key research findings, and the discussion should interpret the meaning of these results to the field of study, discuss the public health significance of the results, and identify areas for future study.

Three Paper Format: In the three paper format, students prepare a dissertation proposal focused on the development of three research papers addressing original research in a chosen topic area. The papers should be of publishable quality in appropriate journals in the field of study. This format of the dissertation proposal has the advantage of ensuring that the substantial work done by both the trainee and the dissertation committee can become part of the published literature.

In the three paper option, the written dissertation proposal should have a theme to which all three papers contribute. The written document should also include the relevant background to the dissertation work in a format which demonstrates the students’ knowledge of the topic area, the results of the work accomplished by the student (presented in the document as the three individual research papers), and a general discussion of the meaning of the work.

Written dissertations in this format may consider the outline recommended below. However, it should be noted that this is at the discretion of the primary advisor and dissertation committee.

> ***Introduction and Background:*** The introduction of the written dissertation should outline the theme of the dissertation, and identify the key research objectives. The background should identify the historical context for the dissertation research, and provide a succinct analysis and synthesis of the literature base in the topic area. The background should also address the manner in which the dissertation represents original research. Consider that the written background is often an abridged version of the literature and is not a complete review as exemplified in a traditional dissertation. Bear in mind, however, that the student will need to do a substantial literature review in order to understand the research in the topic area and argue for how the proposed dissertation project attends to a “hole” in the literature, and why the proposed research objectives are relevant. The student must be able to distill a large body of literature into a concise rationale for the proposed research.

Three Projects: Each project should be presented as a manuscript with a short paragraph introducing how the project relates to the dissertation.

General Discussion: A concluding discussion section should be presented to summarize and discuss the results of the three projects and their place in the literature. Because the three projects each contain a discussion section, the purpose of this summary is to synthesize the results of the three papers as a whole (rather than individually) and to articulate the contribution of the dissertation research in this field.

The summary should also discuss how the work completed is important in the context of public health (i.e. the public health significance of the research findings), and discuss the overall strengths and weaknesses of the dissertation research. Most presentations also identify the logical 'next research questions' raised by the research, provide a final conclusion derived from the completed dissertation work.

Criteria for an acceptable dissertation (any format)

In a successful dissertation project, the trainee should demonstrate mastery of a chosen research topic area, including application of that knowledge in conducting original research on the topic. This requires that the trainee takes "ownership" of the dissertation work, demonstrated through initiation of the project, oversight of data collection and/or data management, data analysis, and research result interpretation. This work is largely completed by the trainee, but involves active guidance from the dissertation committee.

Examples of original research include, but are not limited to:

- Primary data collection – the student collects new data to address a research question in a sole dissertation project, or identifies data (with appropriate methods) that should be added to the methods of an existing research study
- Novel approaches to secondary data - the student applies a new analytic technique or makes novel use of an existing technique
- Development of a new research protocol or way of collecting data
- Execution of additional laboratory assays or genetic evaluation of existing samples

Dissertation progress

In the dissertation process, students are required to complete three milestone exams, the **Overview**, the **Comprehensive** and the **Final Defense**.

- To complete these exams, students must have an appropriate faculty committee to review and oversee the work necessary for completion of each milestone. This committee is often composed of the same faculty members for all three exams. Committee members are typically identified based upon the expertise and consultation that they can bring to an individual dissertation proposal. Advisors should review the school committee guidelines when considering membership of the committee for these exams. Pitt Public Health committee composition requirements can be identified from the school's **the school's Web site.** If student work involves data, policies, or experiences from an outside agency, organization, or practicum site, they should ensure that they follow the guidelines that may include a requirement to have a member of the agency, organization, or site on their committee. A***ny student who will use data or experiences from an experience at the Allegheny County Health Department (ACHD) must include their ACHD preceptor as a member of his/her committee. The agencies with which these members are associated should be identified in the e-mail to Lori.***

In formally designating a committee, the student's academic advisor (typically the dissertation committee chair) should forward an e-mail to the Student Services Manager and Program Administrator for the Department of Epidemiology (currently Lori Smith). The e-mail message should identify the proposed committee members (their titles and department affiliations), the committee chair, and the type of committee being proposed (e.g. Overview, Comprehensive and Dissertation Defense). Members must be approved by the student services manger and the doctoral program director on behalf of the department chair. The proposed committee list is next forwarded to the Pitt Public Health Assistant Dean for Student Affairs for additional approval. When final approval for the committee is obtained, the Student Services Manager will e-mail committee chairs to notify them that the proposed committee has been approved at the departmental and school levels. Committees must be formally approved before milestone exams can take place.

After the relevant committee(s) is(are) formed, it is recommended that the student and committee members meet on an ongoing basis. There are three distinct exams [Overview, Comprehensive, and Final Defense] where committee members and the student will meet together in-person. Additional working meetings of the committee should be considered throughout the dissertation process, particularly between the Comprehensive exam and Final Defense to ensure that the Final Defense goes smoothly. If the trainee is working closely with all committee members throughout the process, then additional, in-person, committee meetings may not be necessary.

Overview Exam: The purpose of this oral exam is to approve the candidate's dissertation topic and research plan. Generally, the trainee presents a brief literature review and the specific aims of the dissertation and demonstrates how the proposed dissertation will fill a void in the existing literature in the topic area.

The student must also formulate a research plan from a methodological perspective that addresses the primary research objectives in the dissertation. Where applicable, the student can also present preliminary results / data from a dissertation paper(s) to demonstrate the feasibility of the research plan, although data is not required for the conduct of the Overview.

The Overview Exam affords the doctoral committee members the opportunity to provide guidance in shaping the conceptualization and methodology of that plan. The committee should focus on whether the trainee is capable of doing meritorious research and has the skills to move forward with the proposed dissertation work, whether the dissertation topic is feasible and meets the criterion of filling a void in the existing literature, and whether the research plan agreed upon in the meeting is appropriate to address the specific aims.

Comprehensive Exam: The purpose of this oral exam is to assess the student's mastery of the general and specific field of doctoral study, the student's acquisition of both depth and breadth in the area of specialization, and the student's ability to use the research methods of epidemiology appropriately for the dissertation plan.

The trainee should present the relevant literature, and summarize key concepts, areas that are well-understood and areas where more research is needed. Where applicable, the student's literature review should also present preliminary results from the dissertation paper(s) to illustrate the strengths and weaknesses of the methodology of the research plan. If a systematic review is performed, it may count as one of the three papers in the 3-paper dissertation format, provided that it is of publishable quality.

In the exam, committee members can ask general questions related to the topic and should discuss issues related to the dissertation project design and methodologic implementation.

Final Defense: At this oral exam, the doctoral candidate presents the completed dissertation project and defends the validity of the work under examination from the committee members.

The student must be prepared to present the results of the dissertation research and defend the research against any and all questions, some of which may not have been raised before. The presentation should present results of the dissertation and a discussion of the meaning of these results in the topic area of study. This requires the successful candidate to be fully versed in all aspects of the research. If the committee and the trainee have worked well together, then this exam marks the formal transition from trainee to researcher.

The committee should assess if the candidate has demonstrated full proficiency in all aspects of the dissertation research.

The final defense, in part, is a public presentation, and as such, the meeting is announced to the public and is open for attendance by other faculty, students, family members, etc. Thus, the dissertation committee chair should not allow this exam to go forward if they do not feel that the trainee is ready. However, there should never be complacency that the defense will be a mere formality.

Regardless of frequency of contact and familiarity of work by committee members, issues may arise, as a result of, for example, newly discovered results or something in the presentation triggering a previously unconsidered thought, so it is not uncommon for students to have to vigorously defend issues previously thought to be settled. To be ready, the candidate must demonstrate a complete understanding of the material in the dissertation and surrounding the research, be polished in their presentation skills and be able to fluently answer complex questions about the research.

Successful candidates need to be able to think on their feet and respond to unexpected questions. They must be able to put their results in perspective relative to the existing literature. In the best cases, the presentation becomes a dynamic discussion of the research area at which the candidate demonstrates that he or she can both raise and answer questions at a similar level as the committee members. Knowing the answer to all questions is not as important as knowing what questions to ask and how to go about answering them.

Timing of dissertation milestones

The Overview and Comprehensive Exams may be held at separate dates, or may be held on the same date. The timing of these exams is at the discretion of the dissertation committee chair in consultation with the committee members. If the overview and comprehensive meetings are held on the same day, each exam must be considered and rated distinctly and individually as part of the committee review of the student's progress. **It should be noted that the Comprehensive and Final Defense cannot occur in the same term**.

It is important to realize that dissertation work does not always fit a set schedule. The successful doctoral candidate is one who realizes that research does not always go according to plan and deadlines are secondary to accomplishing what is required of a dissertation.

Admission to candidacy for the doctoral degree: The admission to candidacy designation constitutes a promotion of the student to the most advanced stage of graduate study and provides formal approval by the committee to the student to devote exclusive attention to the research and the writing of the dissertation. To qualify for admission to candidacy, students must be in full graduate status, have satisfied the requirement of the preliminary evaluation, have completed formal course work with a minimum grade point average of 3.00, and have passed the overview and comprehensive examinations. Upon completion of these requirements, the dissertation committee chair should complete a Completion of Requirements Form to indicate admission to candidacy for the student.

Conduct of Oral Exams

Overview and Comprehensive Exams: At the beginning of the exam, when all committee members have convened, the chair asks the student to leave the room for a few minutes. At this time, the chair provides a brief description of the student's strengths and weaknesses. It is important for the chair to be honest with any concerns that he or she has. This is the chance for the chair to get opinions and suggestions from other committee members. The chair may wish to bring along the student's school record which can be signed out from the Student Services office. Permission for this is granted only to the chair of the committee. When this review is completed, the student is invited back into the room and the exam begins.

In the exam, the student delivers a presentation that has been prepared in consultation with his or her dissertation committee chair. While the length of the presentation will vary, most presentations involve 30-45 slides, followed by a discussion. It is important to realize that sufficient time must be left for discussion. After all questions and discussion has taken place, the chair will again ask the student to leave the room. The committee will discuss the performance of the student during the exam and settle on a decision regarding the pass or fail status of the individual. The required form (Report on Requirements Form for Doctoral Degrees) should be completed to indicate the decision of the committee , signed, and submitted to the Epidemiology Student Services Offices. The chair is responsible for bringing this form to the meeting [it may be downloaded from the **school Web site**.]. The student is then invited back to the room and informed of the outcome of the exam.

Final Defense: As the Final Defense is advertised and open to the public, it is recommended that the meeting begin with an open session. Members of the public and University community are invited, as well as committee members. Questions may be given to the doctoral candidate from committee members during the presentation. However, it is recommended that committee members should consider only questions required for clarification at this point. After the presentation, the chair should invite questions from the public.

When the public question and answer period is finished, the chair should declare that the public session is complete, and begin the closed session of the final defense meeting. **The closed session should include only committee members and the candidate**. It is conducted to allow sufficient time for the evaluation of the parameters of the final defense. Committee members may ask additional questions at this time. When discussion is complete, the chair asks the candidate to leave again, and the committee privately discusses their decision. Recommendations on how to address weaknesses are provided to the chair who relays the comments to the candidate. Committee members are encouraged to provide input directly to the candidate as well.

A closed session of the doctoral committee (without the candidate) should then be conducted. The committee should arrive at a decision on the results of the exam based upon material and discussion provided in both the open and closed sessions.

The Report on Requirements Form for Doctoral Degrees should be completed to indicate the decision of the committee and signed. In addition, the Dissertation Score Form should be completed. The chair is responsible for bringing all forms to the meeting [All forms can be downloaded from the **school Web site** and the **departmental Web site**]. The candidate is then invited back to the room and informed of the outcome of the exam.

Often, even with the best planning, there is work that must still be done after the Final Defense. If committee members indicate that final changes to the dissertation should be made, then they do not sign off until they have seen and approved those changes. It is not uncommon for committee members to defer the decision about whether minor issues have been adequately addressed to the dissertation committee chair and they may sign the form conditional on the chair's future approval. However, any committee member has the right to see all changes and agree to them before signing off.

Failing an Exam

If the committee indicates that the student/candidate was not successful for a given exam, then the committee must identify areas of deficiency and outline criteria necessary for successful completion of the milestone. Both issues must be explained to the student. Failure of a milestone exam is often an infrequent occurrence, because the dissertation chair should have a reasonable sense of where the student/candidate is and should make sure that the student/candidate is adequately prepared for a given exam before it is scheduled. However, there may be times when an important gap is discovered during the exam and the committee members are not comfortable passing a student/candidate, until the identified issues are addressed.

Authorship of research papers from the dissertation

Committee members are often included as authors on the papers produced from the dissertation work, but this is not a requirement. The primary advisor and trainee should make this decision and it should be based on the degree to which a given committee member influenced or contributed to each paper.

It is recommended that the primary advisor and trainee decide on an action plan for papers that are unpublished at of the time of graduation. Time limits should be considered so that papers are not held up if the graduate does not submit papers following graduation. For example, the advisor and trainee may decide that if the work is not submitted for publication within 6 months of graduation, the materials will be turned over to the advisor so that the advisor can move forward with the publication.

Options when the doctoral student is not performing at a sufficient level

There are several critical points at which the primary advisor needs to be confident that the trainee is capable before allowing him or her to move forward. An astute advisor will follow the progress of the trainee at several points, including the four milestone exams, as well as performance in coursework, and research progress. If a student is not making sufficient progress in these areas, the advisor should consult with the doctoral program director and the vice-chair for education, and also review the Pitt Public Health Probation and Dismissal Guidelines (on the Pitt Public Health website) for guidance.

In some circumstances, insufficient progress in research may lie in scenarios where the interests of the trainee and the interests of the primary advisor are not well matched. The option of switching advisors can be raised at this time. In this situation, the student is given the responsibility of identifying an alternate advisor. If the faculty member accepts, then an advisor change form is completed. In other circumstances, students may fail milestone exams due to clear and unamenable deficiencies. In these situations, the option of completing a master's thesis can be discussed with the student.

A failing score on the final defense milestone exam is a serious concern. Thus, all committee members should be reasonably comfortable with the candidate's progress before allowing the defense to be scheduled. Candidates must realize that their dissertation work represents a substantial investment of time on the part of the committee chair and other committee members. Thus, the scheduling of the Final Defense is a commitment that should not be taken lightly. If the candidate insists on going forward without the recommendation of their advisor, the likelihood of failure is a real possibility.