

Expectations of Doctoral Students Regarding Training at the Statistics-Science Interface

Biostatistics comprises the reasoning and methods for using data as evidence to address public health and biomedical questions. It is a methodology for empirical research. Successful research biostatisticians must work at the interface of mathematical statistics and science, translating and connecting ideas from each domain.

An essential learning objective of the Johns Hopkins PhD program in biostatistics is the ability to work at the statistics-science interface: formulating scientific questions in statistical terms; using mathematical and statistical models to quantify empirical evidence relevant to scientific questions; interpreting quantitative findings in scientific terms and communicating key statistical ideas for scientific audiences.

To achieve this objective, Hopkins PhD students are expected to demonstrate their ability to work effectively at the statistics-science interface. Specifically, they must demonstrate their ability to:

1. master and communicate the scientific background, context, language and ideas relevant to a particular research question;
2. represent scientific questions in terms amenable to the design and analysis of empirical studies to address the question;
3. quantify study findings using appropriate statistical ideas and methods;
4. correctly interpret and communicate the statistical results in terms that are meaningful to their scientific colleagues.

Students are expected to:

1. develop expertise in a scientific area outside biostatistics (through course work, self-study, directed reading or other means);
2. demonstrate in the preliminary exam written proposals, preliminary and final public oral exams, and periodic research-in-progress meetings with their thesis committees the ability to communicate effectively with statistical and non-statistical scientists from outside the department about the major ideas from the minor and about statistical concepts and methods in relevant, scientific terms;
3. to submit annual progress reports, to be reviewed by the graduate program directors, during their third through fifth years that detail their training at the statistics-science interface;
4. select oral exam committees and a thesis committee that has adequate representation by non-statistical scientists; the preliminary oral exam committee is expected to have at least two non-statistical scientists. The committees will be approved by the department chair.