

Comments on proposal for Ph.D. in Biostatistics at IUPUI.

1. The case for a Ph.D. program in Biostatistics is strong and well stated. There is no question that this would be a strong addition to the IUPUI offerings. The presence of a Ph.D. program would also greatly enhance the opportunities of current Biostatistics faculty to build their research programs.
2. The lead unit for the Ph.D. appears to be Mathematics, although the Biostatistics faculty listed in the program, who make up a large fraction of the total faculty involved, are basically situated in the Medical School. This is no doubt dictated by the current organizational structure at IUPUI, but it does seem to have potential drawbacks. I don't think most Biostatisticians view their field as a subfield of Mathematics (speaking as someone with an undergraduate degree in Math!) Universities with Biostatistics Departments will have a competitive advantage here.
3. I note that no additional resources are being requested for the program. This may be necessary to get things started, but it does limit the ability to offer something new and attractive. In particular, resources are much more limited than those available at Michigan. If the argument for the program is compelling and the intent is to create a first-rate program, it seems the administration might provide some institutional support.
4. The argument for no new resources is that the program can be developed using existing resources. However I note that of the twelve courses listed as required, only six are currently offered. Thus, half of the core of the program is new, in addition to the time for dissertation direction. So the program appears to impose a considerable additional burden on the faculty.
5. Nearly all the Biostatistics students in my department are supported, both at the MS and Ph.D. level. Thus to be competitive there needs to be a way of funding students.
6. On the Biostatistics side, it appears that many of the additional responsibilities of the program are being assigned to the Biostatistics faculty (many of whom are junior) with the expectation that they would simply be added to their existing duties. Biostatisticians in medical schools often have extensive demands for collaborative research, and try to "shoe-horn" their own methodological search into limited time. If there is additional expectation to teach biostatistics courses and mentor doctoral students, then these activities should in my view be explicitly compensated and rewarded. For example, some fraction of effort should be paid for teaching. I think there are strong reasons for the medical school to support and nurture these activities, since it helps to attract the best possible biostatistics faculty and enhances research in the medical school generally.
7. The program seems to me generally well thought out, with a blend of theory and applications. Some specific comments follow:
 - (a) The statistics group at IUPUI currently offers an MS in Applied Statistics, and does not (I gather) offer Ph.D. courses. The proposal is to add two new courses, STAT619 (Probability Theory) and STAT628 (Advanced

Statistical Inference) to provide Ph.D. level offerings in mathematical statistics. The syllabi of these courses strike me as very old-fashioned, with an emphasis on advanced probability and on classical hypothesis testing. I see no need for a measure-theoretic probability course for a Biostatistics Ph.D., and the inference course seems very narrow – it lacks for example any discussion of Bayesian statistics, which is an active tool of modern biostatistics research.

- (b) It seems that there might be more synergy and coordination of the proposed program with the existing applied MS program in Applied Statistics, since many of the proposed additional courses might strengthen this existing MS program. As one example, the current MS includes applied multivariate analysis (STAT524) as a core course; this course is not a core course in the proposed Ph.D. program, which means a Ph.D. Biostatistics candidate who fails the qualifying exam needs to take this course to get an MS in Applied Statistics. On the other hand, the Biostatistics Ph.D. includes a repeated-measures course (BIOS546) that is not part of the Applied Statistics MS. Arguably the repeated-measures course is more useful for applied statisticians than multivariate statistics.
 - (c) It would be preferable if the required MS-level courses in the proposed program meshed more seamlessly with the current requirements for the Applied MS in Statistics; this might be done by adding a Biostatistics track to the Applied Statistics MS. Students who failed the qualifying exam might then be able to receive the MS without additional coursework. Having them take additional courses to achieve the Applied MS in Statistics seems awkward, since students would rather not stay around after failing the exam.
8. I think the proposal to offer the Qualifying Exam twice a year is laudable, but writing and grading these exams is onerous. At Michigan we have a much larger program but offer our qualifying exam just once a year. We also abolished a Preliminary Examination similar to that proposed on page 6, since it did not really serve a very useful purpose in weeding out students and it delayed candidacy.