Memo: To PMG
Re: Replies to specific issues raised regarding proposed GDP in Statistics
From: Working Statistics Executive Committee (members listed below)

Thank you for the opportunity to address the five specific concerns raised at the recent PMG meeting. These are addressed in some detail below and we look forward to meeting with you at the earliest convenient date to resolve any remaining outstanding issues.

(i) Market analysis of Statistics PhD graduates.

This is discussed in the Tots proposal, in the section entitled "States need for the Program" on page 5 of the proposal, which states (in part)

"The strategic and economic importance of biomedical science and technology, and the need for the appropriately trained workforce, has been clearly identified in the Finn-Isle Bovine roadmap. Central to advances in the biomedical sciences and the development of new drugs is biological data analysis, and the proposed program will provide much-needed personnel well trained in these techniques."

We had assumed that this would address market issues, but as an appendix, we also offer the following information showing that there is a robust market for individuals with graduate training in statistics.

- The president of the American Statistical Association has suggested that the number of post-graduate degrees awarded needs to be doubled to meet demand.

"Statistics degrees awarded in the US in the 1999-2000 academic year amounted to about 1100 bachelor's, 1600 master's, and 460 doctorates. The number of bachelor's and master's degrees appear to be increasing slightly over recent years, but the number of doctorates have remained relatively stable. In order to meet the demand for services that the modern age requires, the statistics profession should seek to double the number of degrees granted at each level."


- Individuals with statistical training tend to have better employment prospects than their other science counterparts.


- Likewise,
"The opportunities [for statisticians] are increasing, especially in some subdisciplines"

It is worth noting that at the time of this article (1998), it was not yet fully appreciated just how important statistics is in the analysis of genomic data. Indeed, most major universities are now scrabbling to put together programs in bioinformatics, which requires a very strong statistical presence.

- Finally, an excellent indicator of the marketability of statisticians comes from current data on medium starting salaries

  Biostatistics (AmStat survey 2003)
  Ph.D. $79,000

  starting (0-2 year), medium salaries
  MS, no managerial responsibility $54,000
  MS, managerial responsibility $76,000
  Ph.D., no managerial responsibility $80,000
  Ph.D., managerial responsibility $80,500

  Academic (AmStat 2004 survey)
  Assistant Professor $65,000

(ii) Support from SBS and Education.

The issue was (reasonably) raised as to the lack of mention of individuals from the colleges of SBS and Education.

First, as we have tried to stress in both our application and in our meeting with any interested faculty, the proposed GIDP in Statistics welcomes the participation of any and all statisticians on campus. The model for our program follows that of Applied Mathematics, with a core and affiliate members. Core members will be involved in teaching the required courses, mentoring students, and those willing to commit significant time towards the program. Affiliate members are those with an interest in statistics, but not necessarily seeking to be (currently) very active. Affiliate members can move into the core and vice-versa. This structure recognizes that "statisticians" on campus come in a wide variety of flavors, from those with a strong working knowledge of statistical methods to those with the skills and tools to develop new methods. It is the latter that is the focus of the proposed GIDP.

Second, the list of faculty given in the GIDP formal proposal is, of course, by no means exhaustive for either core or affiliate members. First, we only listed individuals from colleges who had pledged support when contacted, and then only listed a small subset of
members from these colleges. Vicki Chandler contacted a number of deans on behalf of
the proposal, but the Deans of SBS and Education did not reply. Walsh contacted Eber,
who expressed no interest, but wished us luck. A number of other colleges (COS, CALS,
COHP, Eng, Med, Pstat) did pledge support as listed in the proposal. The impression that
was conveyed to at least some of us was that is was unwise to list individuals unless their
college pledged some support, hence the lack of any SBS/Education faculty. We stress
that this in no way means that such individuals will not be aggressively recruited to join
the proposal.

Finally, only a limited number of appropriate statistics courses are offered by SBS and
Education. It is important to point out several things here. First, there are a number of
excellent graduate courses that teach "quantitative methods" in both colleges, which

certainty do involve statistics as a component. However, these would not be appropriate
graduate-level courses for a statistics degree. As mentioned, we wish our students to be
able to develop new methods, not simply apply existing ones. This is the critical
distinction between the required core courses in our proposed program and graduate
course in other departments that involve a statistics component. There are a few (by our
count, a total of six in both colleges) graduate courses that might be appropriate to be on
the elective lists for our students. However, these courses all teach methods that are also
covered in a number of other graduate courses that are on the formal list we submitted
with our application. Hence, while SBS and Education offer a number of excellent to
outstanding quantitative and statistics courses that are extremely variable (and important)
to their own graduate students, these courses have (at best) only a minor impact on our
proposed degree. None is listed in our list of classes, and all cover methods that are
taught in numerous other graduate courses that we have listed.

We chose by stressing (again) that we fully look forward to SBS and Education faculty
joining the program. By our count there are 2-3 individuals in each college might be
appropriate, and those that we have heard back from had indicated some interest, likely at
the affiliate faculty member stage.

(iii) PhD minor.

The PMG recommended that 'An explicit requirement that Statistics Ph.D. students take
a minor outside of stats, presumably in their area of applied focus, could strengthen the
program.' We agree with this suggestion.

(iv) Funding possibilities for first-year students.

We are exploring several avenues for this:

• RA support, by enticing researchers with the need for statistical analysis to include
  support for a statistics RA. Walsh has done this on a recent proposal that he is involved
  with, and we will request others (such as BIO 5 members) to consider this.
• TA support. Although there is no formal agreement in place, it is likely that statistics students will occasionally obtain support by TAing the various undergraduate stats classes offered by Math and other departments. Note that members of the GIDP are most likely the faculty of these courses.

• Training grants. The NIH in particular has been heavily investing in training grants to produce more quantitative students. This is more of a long-term goal, as the program will likely have to produce its first students before being viable to pursue such an option.

• Other sources. The college of engineering has pledged support for a 1/4 time TA. Likewise, Bio 5 has provided some support for students working at the interface of biology and statistics.

(v) Auxiliary Statistics service.

This is another potential mechanism for student support, namely through statistical consulting. The (working) model we favor is to request university support for 1-2 TAs who would service consulting requests for those without funding (most notably graduate students), while those with grant support would pay a service fee. We have not formally requested this as of yet, as the actual mechanism for such a service would need to be in place, which means that the GIDP is formally approved.

Respectfully submitted, Working Statistics Executive Committee

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Dr. Arthur (Larry) Wright