Working with a Statistician

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Outline

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• Finding a Statistician
• Involvement (roles and tasks)
• The case for early involvement
• Statistician Roles
• Compensation
• Negotiations and Relationships
• Researcher’s Responsibilities
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• Ethical Issues
Statisticians at JHSOM

- In 2008: JHSOM awarded 962 NIH grants for a total of $426,863,323
- 3,860 faculty at JHSOM
- JHED search for statisticians: 89 staff, 45 faculty, 46 students
- ~30:1 ratio

Do you need a statistician?

Grants: yes

Data analysis: maybe/probably
Finding a Statistician

- Biostatistics Consulting Center
- GCRC (Downtown and Bayview)
- BPDC
- Word of Mouth
- Non-Hopkins Affiliated Consultants

Statistician Tasks

- Study Planning
- Grant Writing
- Database design, maintenance
- Data analysis, direction or action
- Preparation of manuscripts/presentations
The Case for Early Involvement

• Pros:

• Cons:
  – Loss of control, expense (fees/salary support), authorship (?), lack of substantive knowledge.
Statistician Roles

- **Helper:** technician; responds to questions. Accountability problems.
- **Leader:** lack of substantive expertise.
- **Data-Blesser:** curb-side advice.
- **Collaborator:** involvement throughout the project.
- **Teacher:** should be mutual, integrative.
- **Archaeologist:** my other statistician stopped returning my e-mails…


Compensation

- Biostatistical faculty are promoted largely on the basis of their contributions to *biostatistics*.
- Fees
- Salary support from grants
- Authorship, esp. on methods-slanted papers
- Acknowledgements (papers and talks)
Power Analyses (a priori)

• Not my favorite thing to do
• Work done “on spec”.
• Based on untestable assumptions.
  • Result can vary widely based on assumptions made about effect size, standard deviation of outcome, and particularly, within-person correlation and correlation structure.
• The recommended N is almost always bad news.

Authorship

• International Committee of Medical Journal Editors:
  A) substantial contribution to a) conception and design or b) analysis and interpretation of data.
  B) drafting the article or revising it critically for important intellectual content.
  C) final approval of the version to be published.


Accepting payment does not waive one’s right to authorship.
Caveats

• Get permission before including someone as an author or acknowledgement.
• At any stage.
• Using someone’s name implies endorsement of the paper/talk/poster.
• Mentioning that you spoke to Dr. X for advice on how to do Y implies that you actually took their advice on how to do Y.
• If they waive acknowledgement or authorship, try to find out why, this could be a red flag.
Negotiating the Relationship

- Doing this badly (or not at all) can lead to disaster.
- Be very frank about expectations, roles, compensation, timetables/deadlines.
- Put it in writing (e-mail).
- Ask about policies, how and when they can be contacted, etc.
- A particular statistician may not be a good fit.
- Needs to occur at first (preferably in-person) meeting.

Awkward Interactions

- Condescension, or fear of condescension
- Social ineptitude
- Hesitancy about negotiating money, etc.
- Power differential
- Negative preconceptions

“I just figured out why we’ve never had girlfriends.”
Researcher’s Responsibilities

• Frank negotiation of the relationship
• Substantive teaching, methodological learning
• Setting and meeting deadlines
• Compensation, including appropriate attribution
• Provision of accurate data*, answers to all questions about study design, codebook, etc.
• Accurate reporting of results

Statistician’s Responsibilities

• Frank negotiation of the relationship
• Methodological teaching, substantive learning
• Clear explanation of methods and results.
• Setting and meeting deadlines
• Sufficient documentation such that an independent statistician could exactly replicate results.
• Accurate reporting of results.
Documentation

- Statisticians should be able to provide details about the analysis: I used this equation on p. 417 of thus and such article.
- “I used proc mix.” is not sufficient.
- What software they used, and relevant log files and/or computing code*.
- Failing to provide documentation is irresponsible, wastes time, and exposes both parties to accusations of ethical violations.
- www.reproducibleresearch.net

Ethical Issues

- Publication biases.
- Importance of statistician independence.
- Agree on an analysis plan before data is collected, or at least, looked at.
- Agree on stopping rules (clinical trials).
- No explicit or implied reward for desired results.