Statistical Consulting

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Conflicts of Interest

• Employment
  – BIDMC
  – HSPH
• Other Income
  – American Heart Association
Purpose

• Want to lead a discussion about the statistical consulting process
• Looking for ways to improve interactions with investigators
• Hope to open dialogue between consultants with limited experience and those with more extensive experience
Overview

• To provide a framework:

Overview

• Discussion
• Think about consultations that were difficult
  • What were the barriers?
    – Subject area
    – Statistical methods
    – Investigator
  • Approaches to remove barriers
Kirk article

• Introduction
• Stages of the consulting process
• Roles of the consultant
• Challenges
Introduction

“Statistical consulting is the collaboration of a statistician with another professional for the purpose of devising solutions to research problems.”
Stages of the Consulting Process

• Establish rapport
• Identify the research problem
• Set goals
• Agree on division of responsibility
• Sum up
Establish Rapport

• “Exchange of pleasantries and small talk”
  – Put clients at ease
  – Exhibit accepting, caring attitude
  – Gather information
    • Level of research experience
    • Training/comfort with statistics
Identify the Research Problem

• Client describes the research:
  – Questions to be answered
  – Why these questions are important
  – What has been accomplished so far

• Specifically, why is the client here?

• Most important stage
Identify the Research Problem

- Communication needs to be bi-directional

“However the transaction may begin, its sound progress depends crucially on one thing: that the clinician and statistical consultant (ultimately) deal with the same problem.”

Identify the Research Problem

• Make sure you understand the clinical setting
• Opportunity to improve rapport
• Ask questions!!
  – Can help establish your credibility
  – Indicates you care enough to get it right
  – Puts client at ease to ask questions
Identify the Research Problem

• Caveats
• Beware of the client who knows just enough statistics to be dangerous.
• Beware of the statistician who knows just enough medicine to be dangerous.
Identify the Research Problem

• Make sure you understand the research
• Have client describe all relevant aspects of the study, including:
  – Design
  – Source of data
  – Outcome measures
• Never assume!
Set Goals

- Determine questions to be answered
- Determine actions to be taken
Set Goals

- If consultation occurs at the design stage, offer advice on:
  - Sampling strategies
  - Randomization
  - Threats to internal and external validity
  - Data collection and data management (e.g., Excel bad, REDCap good)
  - Ethical issues (including IRB)
Agree on Division of Responsibility

- What are the next steps?
- Who will do each step?
- When?
Sum Up

• Review what has been discussed
• Make sure the clients needs have been met
• Make sure there are no important details that remain
Consulting Roles

- Helper
- Leader
- Data Blesser
- Collaborator
- Teacher
Helper

- Statistician acts as a technician
- Responds to client’s questions and direction
- May be what client is looking for
- Generally, not an acceptable role
Leader

• Client may want the consultant “to assume responsibility for making sense out of the client’s data”
• Suggests a fishing expedition, not hypothesis-driven research
• Generally, not an appropriate role
• Subject area expert should lead
Data Blesser

- Client wants a quick appraisal—Did I do this correctly?
- Be very careful!
- Make sure you fully understand what has been done before you answer
- Memorize the phrase, “I’m not sure, I need more information.”
Collaborator

• The ideal role!
• “Client and consultant pool their talents and expertise so that the resulting research is better than that which would have occurred in the absence of the collaboration.”
Teacher

• The consultant should be a teacher in EVERY consultation.

• Ideally, the client also has a teaching role in most consultations.
Challenges

• Negotiating aspects of the consultation
• Communication and interpersonal skills
• Wide range of subject areas clients bring
• Statistical knowledge base that increases exponentially
• Academic promotion
Negotiating

• Negotiating role
  • Try to understand and address clients concerns
  • Your leverage is greatest early in the process

• Authorship
  • HMS guidelines are you friend!
  • http://hms.harvard.edu/about-hms/integrity-academic-medicine/hms-policy/faculty-policies-integrity-science/authorship-guidelines
Communication and Interpersonal Skills

• Eye contact
• Influencing the direction of consultations
• Good communication skills
• Be an “active listener”
• Excellent resource:

Diverse Subject Areas

• It is the nature of the job
• Think of it as an opportunity to learn new things
• Also an opportunity to identify potential for new collaborations
Growth of Statistical Knowledge

• Impossible to keep up with every aspect of biostatistics
• Internet searches
• Good chance that the world’s expert on the area is down the hall, across the street, or across town!
Academic Promotion

• Consultation, *per se*, is not valued in the promotion criteria
• Provides opportunities to identify need for novel methods and novel application of existing methods
Discussion Topic

• Think about consultations that were difficult
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