W Thomas: Working with clinical investigators as a grad student

Settings:

• Biostat RA does applied biostatistics under supervision of Biostat faculty and AHC collaborator(s).

Level of interaction with investigators depends on faculty supervisor and your performance

• Later in PhD program, perhaps find RA position in another department: work directly with investigator(s)

Phases of a data analysis:

1. Understanding the data, finding and resolving its problems
   *May take 50–75% of time for “analysis”*

2. Performing the analysis, reporting results

3. Reports for DSMB during trial

4. Writing the paper

5. Responding to referee reports about the paper; resubmitting the paper (can be several rounds of this)
1. Be prepared

• Read the study protocol: know how the data was collected

• Learn enough of the science to understand the background sections in the protocol (Google, Mayo Clinic website)

• If the investigator has published on this subject, read the paper (E-journals)

2. Listen carefully and critically

• Understand the bigger issues motivating the research, the aims for the trial, and specific questions for your analysis.

• Ask questions.

• Investigators may present the issue as a textbook stat problem or a computing problem. Think about the research question, check the investigators’ statistical assumptions and modeling set-up.
  
  – “I’ve measured proportions. Should I use an arcsine transformation?”
  
  – “I think you can just do paired t-tests between baseline and each follow-up measurement.”

Sometimes helps to ask them to explain about “the big picture” first.
3. Write a careful report to present results of data-cleaning or analysis

• Report is not a stack of output.

• Report is not a narrative of all the things you did or tried

• Background on data (missing pattern, transformations, etc); findings summarized in paragraphs and shown in a table or figure or both.

• Try to make a plot that shows everything.

• Learn to make tables in MSWord.

• If you can’t explain what you did so they understand it, they won’t believe it’s correct.

4. Know the target

• Learn the structure of papers in medical journals.

  Statistician is responsible for sections on design, subjects, results, tables, figures, as well as Stat Methods.


  http://www.consort-statement.org/

• Learn to make publication-quality plots in R
5. Get it right

• Do what is asked, as far as possible. Your own ideas are extra, not a substitute.

• Try to check your work: Are results consistent with each other?
  Is the number of observations correct?
  Do results make sense?

• Don't rush to send off results. Let them sit and think about them a bit.