

# 1 Consulting

- **Aaron Rendahl (2010)**

Essentially anything statistical that isn't sitting alone in your office doing research or teaching/taking a class is statistical consulting.

- **Hyams (Biometrics, 1971) described the ideal consultation:**

... The 'Ideal Consultation' is not a consultation. It is a working-together, a voluntary meeting of minds and union of energies whose prime aim is to seek a 'truth'. In such meetings both parties are familiar with each other's basic language. ...

- **Derr (2000) begins:**

Statisticians often work with people in other professions and disciplines.

- **Cabrera and McDougall (2002) add:**

Ultimately, [statistical consulting] is about communication . . .

- **From the ASA Section on Statistical Consulting:**

Statistical consulting is the most challenging and most rewarding part of statistics. A consultant uses the art and science of statistics to solve a practical problem.

## 2 What does a statistical consultant do?

- Works with scientist from other disciplines (clients/collaborators)
- Abides by ethical guidelines for scientists in general and statisticians in particular
- Leads meetings with clients and collaborators
- Obtains basic knowledge of context of research study by asking many questions
- Listens actively
- “Translates” research study into realm of statistics (statistical models)
- Advises on study design such that research questions can be answered based on the resulting data
- Recommends sample sizes
- Advises on required data cleaning/organization
- Chooses visualization and data description tools
- Recommends tools from inferential statistics for addressing research questions
- Considers all assumptions for selected statistical tools
- May execute statistical analyses
- Helps interpret graphs
- Explains interpretation of results from inferential statistics (including limitations)
- Supports researchers writing Method (statistics) and Result sections for publications
- Proofreads publications with focus on Method and Result sections and Discussion

### 3 A statistical consultant should ...

- be interested in science: requires interest in the pursuits of science
- have extensive statistical knowledge: training and education in statistics on a diverse range of statistical tools is the basic requirement
- know what they don't know
- have sufficient computer proficiency: computer skills are essential, R and SPSS
- have strong interpersonal skills: effective communication is crucial for all steps in the process
- be well organized: time management, priority system
- be guided by ethical values: consider client confidentiality, possible issues with data collection and use of results, proper use of statistics, truthful reporting, etc.
- be curious about the world and a wide range of topics: consulting is no fun without it
- be willing to learn
- enjoy solving problems

## 4 Disciplines and sectors benefitting from statistical consulting

- Medicine
  - Public Health
  - Epidemiology
  - Genetics
  - Dentistry
  - Nursing
  - Pharmaceuticals
  - almost all research
- Natural Science
  - Biology
  - Chemistry
  - Physics
  - Ecology
  - Computer Science
  - Astronomy
- Social Sciences
  - Sociology
  - Psychology
  - Criminology
- Sectors
  - Market Research
  - Business Consulting
  - Government (federal/provincial/community)
  - Sports
  - Banking and Insurance
  - Pharmaceutical industry
  - Chemical industry
  - Education
  - (Social) Media
  - Transportation
  - Tourism
  - Energy
  - Manufacturing
  - Engineering
  - Retail
  - Journalism

- Law
- Agriculture
- Arts (some)
- Departments
  - Management
  - Human Resources
  - Research and Development
  - Institutional Planning
  - Marketing
  - Accounting