



UNIVERSITÄTS**medizin.**

MAINZ

Portrait of a consulting biostatistician  
ISCB students' day 2017

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# Statistical consulting service at IMBEI

IMBEI has a long tradition of providing statistical advice for physicians and medical students

Partially funded by UMC

Medical students can obtain statistical advice for their MD theses free of charge

Physicians at the University Medical Center and associated teaching hospitals can obtain basic statistical advice for any research project free of charge

All biostatisticians and some epidemiologists at IMBEI provide the service

Consulting appointments for MD students on two or three days a week

One consulting day for MD students per month per consultant

# Academic background

Biostatistics is a multidisciplinary profession

Typical degrees

(Bio)Statistics

(Bio)Mathematics

Psychology

Medicine

Epidemiology

Medical informatics

Biology

Bio-Engineering

Physics

# Consulting for medical students

Prerequisite: one day course

Research question

Elementary descriptive statistics

Introduction to SPSS

Registration for consultation, allocation to biostatistician / epidemiologist, date of first appointment

Allocation essentially by available and desired appointment times biostatisticians are exposed to a wide selection of medical specialities

# Consulting for medical students

Three appointments with a biostatistician / epidemiologist

Research question, study design, intended analyses, planning data collection

Review data, refine analysis plan, explain how to do analysis using SPSS

Computer lab with dedicated colleague to help with common technical problems

Interpretation and discussion of results

Review methods & results sections of thesis

Involvement of biostatistician / epidemiologist may be extended if a publication follows

# Consulting for physicians

Registration for consultation, allocation to biostatistician / epidemiologist

Each statistician / epidemiologist serves as contact for two to six departments (depending on size and research activity)

biostatisticians obtain extended experience in some medical specialities

Three appointments per project are possible in any case

# Consulting for physicians

Similar topics as with students plus

- Study protocols

- Applications to ethics committee

- Grant applications

- Preparation of manuscripts

Intensity of involvement depends on

- Funding of project

- Methodological interest of the statistician

# Discussion of consultations

Monthly meeting of all biostatisticians and epidemiologists involved in consulting

Discussion of interesting and/or difficult cases

Young colleagues are encouraged to present most of their cases

Exchange of knowledge and ideas

How can this be solved this in SPSS/SAS/R?



# Tasks encountered and necessary skills

## Task: Research question

Medical students have a general idea what they want to achieve, but often have difficulties translating this into variables and statistical hypotheses

### Necessity to operationalize the research question

- Decision for meaningful endpoints

- Decision whether analysis should be confirmatory or exploratory

## Necessary skills:

### Communication

- Listening and gentle prodding

- Making sure that the formulated operationalized question is indeed what the student is interested in.

Basic understanding of the medical problem – ask, read...

Patience!

# Tasks encountered and necessary skills

## Task: Study design

Figure out whether a standard design is appropriate

in MD theses rarely go beyond standard designs

If not: research whether similar problems have been encountered and solved previously

If nothing can be found this may lead to

Trying to adapting a known design (given time and methodological interest)

Re-thinking the research question with the client

## Necessary skills:

Knowledge of common study designs

Communication

# Tasks encountered and necessary skills

## Tasks:

- Intended analyses and refining analyses
- Interpretation and discussion of results

## Necessary skills:

- Knowledge of standard statistical procedures
- Ability to learn new procedures as you go – depending on area of application
- Being able to explain statistical ideas in an accessible way

# Tasks encountered and necessary skills

## Tasks: Planning data collection and reviewing data

- Checking questionnaires

  - Are outcome exhaustive and mutually exclusive

- How should data be entered

  - Insisting on suitable table structure

  - Long vs wide format for repeated measurements

- Data cleaning and plausibility checks – should be done by the client

## Necessary skills:

- Knowledge of relevant statistical software and data structure necessary for intended analysis

- Knowing how to handle Excel and/or database systems is extremely helpful

# Tasks encountered and necessary skills

Tasks: Study protocols, applications to ethics committee, grant applications

- Writing or contributing to methods section

- Sample size calculation

- Specifying the statistical analysis

Necessary skills:

- As before plus

  - Scientific writing

  - Knowing guidelines such as ICH, GCP...

  - Knowing criteria and forms

  - Negotiating skills: Making sure that funds for statistics are part of grant applications. Our rule of thumb: 25% of a statistician's salary for the duration of the research project.

# Tasks encountered and necessary skills

## Tasks:

- Review methods & results sections of thesis
- Preparation of manuscripts

## Necessary skills

- Scientific writing
- Being able to explain statistical ideas in an accessible way
- Communication with collaborators during writing process

# Summary and some advice

Combination of subject knowledge and interaction with people

Communication skills and subject knowledge are equally important

Willingness to get involved with diverse topics and quite different people

Ability to arrive at a (sensible) compromise

Ability to say no politely

Statistical consulting can be very rewarding, but it may have to be balanced with research and other obligations