

How your KL2 biostatistics advisor can help

We can help with

- papers
- grants
- analyses
- programming, data management

Help with papers

- design and implementation of analysis
- interpretation of results
- writing up stat methods and results
- responding to reviewers

Help with grant proposals

- study design, sample size for complicated problems, analysis plans
- writing section D.xx: Analysis Plans and Sample Size
- faculty scholars: Grant Development Assistance Program
if grant will cover 10% biostatistician salary
<http://ctsi.ucsf.edu/research/bread-consult>

Help with analyses

- mainly regression problems:
 - what model to use
 - what predictors to include
 - model checking and interpretation
- special problems

Which model to use depends on the outcome

continuous: linear (STATA `regress` command), also gamma (`glm`) and proportional odds (`ologit`)

binary: logistic; also relative risk models: `glm` with log link, poisson with robust SEs

ordinal: proportional odds (`ologit`, `gologit2`), continuation ratio (`ocratio`)

nominal: polytomous logistic (`mlogit`)

time-to-event: proportional hazards (`stcox`), pooled logistic model for Framingham-like data

counts: Poisson, also negative binomial (`nbreg`)

Special methods needed with

individually matched case-control data: conditional logistic model (`clogit`)

complex survey data: NHANES, NAMCS, NHAMCS, NHDS, others (`svy` commands, SUDAAN, SAS)

longitudinal or clustered data: random effects, GEE models (`xt` commands)

observational treatment data: propensity scores, marginal structural models, instrumental variables

missing data: multiple imputation, ML models, but not GEE, provided data are *missing at random* (MAR)

Special methods also needed with

genomics, proteomics data: usual regression techniques fail with high-dimensional predictors

other genetic data: family disease patterns, determining haplotypes

What predictors to include and exclude

- include:

confounders: what could explain association between primary predictor and outcome?

effect modifiers: does the effect of the primary predictor vary across subgroups?

- exclude:

mediators: variables on causal pathways between primary predictor and outcome; use nested models

common effects of predictors and outcomes

- methods for model selection; how many are too many?

Post-regression analyses

checking fit: residuals, plots, augmented models

adjusted means and prevalences: adjust command

tests: pairwise contrasts, heterogeneity, trend

interpreting negative results: focus on the CIs

bootstrapping: when model-based CIs may not be trustworthy or aren't available

Other types of analyses

prediction: risk stratification rules, ROC curves, net reclassification tables, cross-validation

diagnostic tests: sensitivity, specificity, PPV, NPV, likelihood ratios

agreement of new and old measurements: intra-class correlation (ICC), Bland-Altman plots

meta-analysis

Ask Chuck

- also other biostat faculty
- and you (this is a collaborative endeavor)

Help with data management and programming

- STATA, ATCR courses are useful, user-friendly
- de-bugging by e-mail
- graphics: STATA, Excel, R, other packages
- other stat/data management packages: SAS, SPSS
- transferring data:
 - between machines: e-mail, CD, flash drives
 - between platforms (PC, Mac): Excel, STATA, SAS files carry over
 - between packages: text data files, StatTransfer

Some suggestions for analyses you implement

- use programs (do-files) and create log files with results
- save and back up original data sets and all programs
- write a do-file to make an analysis data set
- write additional do-files to run analyses

Help from Feng Lin

- superb KL2 programmer/analyst with MS in statistics
- help with special problems:
 - complicated data management
 - repetitive analyses that can be automated
 - complicated analyses not covered in courses
- see orientation packet for how to apply for Feng's help

Getting help from your biostat advisor

- meet by appointment at CBL
- consult by e-mail or phone
- get in touch, we are glad to help!