The SCTR Biostatistics, Epidemiology, and Research Design (BERD) Program

Paul J Nietert, PhD
Division of Biostatistics and Epidemiology
SCTR Research Lunch-N-Learn
October 20, 2010
Overview

• The BERD mission
• How the process works
• How we prioritize requests
• Examples of how we assist investigators
• Summary of one of my current projects
Our Mission

• Provide methodological expertise to translational researchers at MUSC (&USC).

• Stimulate methodological development in the areas of study design and biostatistics.
Who Are We?

• Paul Nietert, PhD
  – Associate Professor
  – 15 years of experience as an applied biostatistician
  – Research interests: group randomized trials, clustered data analysis, comparative effectiveness research, health services research
Who Are We?

• Amy Wahlquist, MS
  – 50% SCTR BERD Core
  – 50% HCC Shared Resource Core
  – LOTS of hands-on experience assisting researchers, reviewing protocols
  – Research interests:
    • Cancer research survival analysis
    • Design and analysis of pilot studies
Who Are We?

• Bethany Wolf, PhD
  – Start date is Dec 6!
  – Recent MUSC DBE graduate
  – Post-doc in HCC
  – Research interests:
    • Data mining methods for data with large number of predictors and small number of observations
    • Improving statistical methods for identification of sub-populations among individuals with disease (e.g. ER+ vs. ER- breast cancer)
    • Developing statistical methods for biomarker discovery and validation
How the Process Works

• Investigator creates a protocol in SPARK.
• Then he/she submits a “service request” through SPARK.
• Request is routed to BERD staff.
• Priority is assigned by BERD.
• Contact with made with investigator.
• Work is conducted.
• Currently done at no cost to the investigator.
Scientific Retreat on Telemedicine

North Charleston Embassy Suites -- November 19, 2010

A keynote speech and few local speakers provide research presentations & group discussions and networking to develop potential collaborations including SCTR Institute pilot project initiatives for the 2011-2012 cycle. The objective is to stimulate new collaborative research projects among bioengineers, basic scientists, clinicians, nurses, other health professional researchers, and the community that would lead to productive pre-clinical, clinical, or translational research.

Deadline to register: October 15, 2010

Click Here to Register
Prioritizing Requests

- SCTR funded investigators
- Projects utilizing CTRC resources
- Translational grant development
- Preliminary analyses for any of the above
- Assistance with unfunded research
  - Manuscripts, Abstracts, IRB applications
- Assistance with internal QC projects
Examples of Requests

• Sample size / power estimation
• Analyses of preliminary data for a grant
• Developing analysis plans
• Assistance with manuscript preparation
• Grant review
• Survey design
• 1 on 1 didactic teaching
Other Activities

• Review all CTRC protocols
• Review SCTR pilot project proposals
• Interact with BERDs at other institutions
  – Conference calls
  – Face-to-face meetings
• Activity reporting
Methodological Work

• Ideally stems from our interactions with translational researchers

• Examples
  – Small study design
  – ROC curves with correlated data
  – Accounting for uncertainty in assumptions in power / sample size estimations
Statistical Power

• Probability of rejecting the null hypothesis given that the alternative hypothesis is true.
True or False?

- Q: As the sample size increases, statistical power increases.

- A: True (usually)
Example: The Sign Test

• Simple test to compare outcomes from 2 groups
• Possible outcomes include:
  – A>B, B>A, A=B
• Test statistic ignores tied observations.
• Sample size depends on the anticipated number of tied observations.
Power vs. Number of Non-Tied Observations
## Effect of Uncertainty on Power (n=50)

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<th>Proportion Tied</th>
<th>No uncertainty (SD=0%)</th>
<th>Mild SD=1%</th>
<th>Mod. SD=5%</th>
<th>Severe SD=10%</th>
<th>Extreme Uniform</th>
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Other Biostatistics Resources

- HCC Biostatistics Shared Resource
  - Dedicated to helping with cancer related projects
- DBE Collaborative Unit
  - Focus is grant development
- DBE Data Coordination Unit
  - Focus is multi-center clinical trials
Contact Information

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