How Can CSTAT Services Benefit You?

Dhruv B. Sharma, PhD
Senior Statistician

RAIND Seminar
03/31/2017
CSTAT’s Mission & Role at MSU

We are a professional service & research unit providing:

• Training workshops
• Grant development assistance
• Statistical advice & consulting services
• Collaboration on research projects

https://www.cstat.msu.edu/
Consulting Team

• 5 full-time, professional statisticians (PhD)
  • Steve Pierce, Acting Director
  • Sarah Hession, Assistant Director
  • Frank Lawrence, Senior Statistician
  • Dhruv Sharma, Senior Statistician
  • Wenjuan Ma, Senior Statistician

• 4-8 doctoral students (MA/MS)
About me!

- Senior Statistician at CSTAT since 2014.
- PhD in Statistics in 2010, from NC State University.
- Postdoc in Biostatistics in 2012, from Harvard School of Public Health and Dana-Farber Research Institute.
- 80 basic consulting cases for a total of about 732 hours.
- 28 enhanced/partnership cases for a total of about 3473 hours.
## Scholarly Productivity

<table>
<thead>
<tr>
<th>Research &amp; Creative Works</th>
<th>Published</th>
<th>Under Review</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Book Chapters</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Articles</td>
<td>6</td>
<td>3</td>
<td>9</td>
</tr>
<tr>
<td>Conference Papers</td>
<td>5</td>
<td>0</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>13</strong></td>
<td><strong>4</strong></td>
<td><strong>17</strong></td>
</tr>
</tbody>
</table>

Summary of research publications, papers, and other creative works, published or under review in the past three years.

In addition to this list, I am currently working on drafts for seven research manuscripts.
## Grants & Contracts

<table>
<thead>
<tr>
<th>Grants &amp; Contract Proposals</th>
<th>External</th>
<th>MSU Internal</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>In preparation</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>Under review</td>
<td>0</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Awarded</td>
<td>2</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Declined</td>
<td>3</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>6</strong></td>
<td><strong>12</strong></td>
<td><strong>18</strong></td>
</tr>
</tbody>
</table>

Summary of grant & contract proposal related activity in the past three years.

In addition to this list, I am currently working on one additional external grant application and two additional internal grant applications.
Consulting Services

• Support research (not coursework)
• Interactive, one-on-one approach
• Customized to client’s specific project
• Initiated by client request

https://www.cstat.msu.edu/consulting/Default.aspx
CSTAT Workflow

- Client
  - Submit request re: new project
  - Confirm receipt
- CSTAT Office Staff
  - Forward request
  - Assign CaseID
  - Enter case
- Operations Database
  - Record assignment
- Dr. Sharma/Dr. Hession
  - Assign case
- Primary Consultant
  - Contact re: scheduling
<table>
<thead>
<tr>
<th>Feature</th>
<th>Basic Services</th>
<th>Enhanced/Partnership Services</th>
</tr>
</thead>
</table>
| **Focus:** | • Build client capacity & knowledge  
• Suggest methods & resources  
• Teach skills | • Hands-on project work  
• Data analysis & writing methods/results  
• Collaborate on proposals & funded projects |
| **Eligible:** | • Faculty  
• Research staff  
• Grad students | • Faculty  
• Research staff  
• External clients |
| **Fees:** | • Free to MSU clients | • Depend on nature & scope of work |
Collaborating on Grant Proposals
Lay the Foundation

Orient the statistician to:

• Basic topic area
• Specific aims & hypotheses
• Schedule
  • Submission deadline
  • Start & end dates
Negotiate the Statistician’s Role

• During proposal writing
• On project (if funded)
  • Tasks & responsibilities
  • Effort (% FTE)
  • Indirect cost credit
<table>
<thead>
<tr>
<th>Role</th>
<th>Personnel Type on eTransmittal</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Co-PI</td>
<td>Investigator: PD/PI</td>
<td>Collaborate broadly on aims, rationale, design, &amp; implementation</td>
</tr>
<tr>
<td>Co-I</td>
<td>Investigator: Key Personnel</td>
<td>Typical Biostatistician role Narrower focus on statistical methods &amp; tasks</td>
</tr>
<tr>
<td>Consultant</td>
<td>Consultant</td>
<td>Much narrower focus</td>
</tr>
<tr>
<td>None</td>
<td>Not listed</td>
<td>Help w/ proposal but not on resulting project</td>
</tr>
</tbody>
</table>
Proposal Workflow: eTransmittals

1. **College Researcher**
   - Send bid
   - Negotiate role

2. **CSTAT Statistician**
   - Discuss draft bid
   - Sign for CSTAT

3. **Dr. Pierce / Dr. Hession**
   - Negotiate role

4. **College Grant Administrator**
   - Develop budget
   - Sign
   - Route for signatures

5. **eTransmittal**
   - Sign for CSTAT (college level)

6. **College Dean**
   - Sign (college level)

7. **VPRGS**
What Can CSTAT Do to Help You?!

Every stage of research raises statistical issues

- Proposal development
  - Developing study aims
  - Research design
  - Implementation
  - Randomization, or sampling
  - Data collection & management
  - Analysis & interpretation
  - Presentation

A statistician can help at every stage!

Integrated entirely.

Simultaneously or one-by-one.

Statistics-related here
Study Aims Stage

• Questions? Hypotheses? Expectations?
• Population & subpopulation?
• Variables & characteristics
  • continuous, categorical, or ordinal?
• Importance?
• Feasibility?
Research Design Stage

• Design methods?
• Intervention vs. intervention? Delivery?
• A control? What control?
• Randomize subjects? Contamination?
• Single or double blind?
• Sampling? Potential bias?
• Variables/data? How to collect? Who? When?
• Sample size?
• Data analysis plan
Implementation Stage

Location of subjects, or sampling
• Randomization: Who and How?
• Sampling: What method?
Implementation Stage

Data collection & management

• Data forms & instruments
• Database design
• Data entry & quality control
• Codebook & other descriptions
Data Analysis Stage

- What are the data/variables characteristics?
- Choose variables & methods to address an aim
- Interpretation!
Dissemination

- Preparing good tables & graphs
- Writing final reports & manuscripts
- Responding to peer reviewers
Thank You!

Questions?