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Reviewing and Writing Grants

Jonathan M. Samet
Department of Epidemiology

Specific Aims Section

- **Critical section**
- **“Trailer” for the grant**
- **Includes**
 - **Statement of scientific problem**
 - **Overview of scientific approach**
 - **Specific hypotheses to be tested**
- **The “most read” section**

Specific Aims—”Dos”

- State what will be done
- Give specific study design
- Provide an overview of scientific issues and questions
- State specific hypotheses
- Describe public health significance

Specific Aims—“Don’ts”

- Make priority claims
- Promise too much
- Offer descriptive goals
- Just summarize the grant

Specific Aims—“Watch out”

- “Little is known about x, therefore we...”
- This will be the first study of x, using the unique resource afforded by y.
- In spite of decades of research, questions remain unanswered concerning x...
- The findings of this study will guide the development of preventive approaches for disease x.

Background and Significance

- Not just a review
- Critical to highlight what is known and the open questions in the face of available evidence
- Needs to be synthetic not exhaustive
- Interesting not boring
- Sets up the scientific basis for the grant

Background and Significance— Going Wrong

- Limited review—Little is known about x
- Misrepresenting findings
- Not synthesizing
- Too long and too boring
- Not citing the reviewers

Preliminary Studies/Progress Report

- Highlight expertise
- Provide relevant preliminary data
- Document feasibility
- Cover the entire team

Preliminary Studies/Progress Report—Going Wrong

- Excessive claims of excellence
- Too much information
- Showing that too much work has been done
- Not establishing feasibility

Methods 1

- Useful to start with an overview to orient reviewers
 - Good spot for diagrams
- The details
 - Study design
 - Population selection
 - Data collection
 - Data management
 - Data analysis
- Other stuff
 - Human subjects

Methods 2

- Overview
- Give study design in relation to study questions
- Describe population and study questions
- Justify what will follow

Methods 3

Population Selection

- Why was the population selected?
 - External validity?
 - Feasibility?
 - Prior investigation?
- How will the population be selected?
 - Potential for selection bias?
 - Representative of the population?

Methods 4

Data Collection

- What are the items to be collected?
- How will they be collected?
- Does the grant build from standard approaches?
- How will instruments be validated; measurement error assessed?

Methods 5

Data Management—QA/QC

- Critical!
- Give plan for data management with details
- Set out systematic QA/QC approach
- Conspicuous by absence

Methods 6

Data Analysis

- Needs to match data collected and hypotheses
- Not a biostatistics tutorial
- Be specific—give models
- Specify variables
- Do not be generic

Methods 7--Power

- Always a game with assumptions
 - Document basis for all assumptions
- Do not exaggerate power
- Provide a range of calculations and assumptions
- Provide for major scientific question

Methods 8

Limitations

- Describe potential limitations
- Framework—confounding, selection bias, information bias, and power and precision
- Anticipate and don't hold back
- Be honest and not dismissive

Reviewing a Grant--1

- Start with Specific Aims
- Then to Methods
- And then to Preliminary Studies/Progress Report
- And then to remaining sections

Initial question—is the science at an acceptable level?

Reviewing a Grant –2

Good scientific question?

- Study novel or repetitive?
- Independent contribution or “me too”
- Old question—new twist?
- Pass the “well so what” test?

Reviewing a Grant—3

Design Issues

- Appropriate design?
- Population with reasonable external validity?
- Feasibility established?
- What kind of approach to population selection?

Reviewing a Grant—4

Data Collection

- Use of standard instruments? The right instruments?
- Approach to data collection—standardized? Interviewer training?
- Approach to QA/QC—adequate? Set out?
- Data management system
- Data manager

Reviewing a Grant—5

Data Analysis

- Right methods?
- Textbook or tailored?
- Linked to hypotheses and specific aims?
- Expertise available?
- Methods development needed?

Reviewing a Grant—5

Power

- How calculated?
- Assumptions stated and reasonable?
- Measurement error issues considered?
- Power given for all main hypotheses or selected?

Reviewing a Grant—6

Strengths and Limitations

- Recognizing weaknesses is not a solution
- Reasonable solutions proposed to problems?
- Are strengths exaggerated?
- Priority claims?

Study Section-1

- In Epi, cover broad areas—cancer, CVD, for example
- Broadly multidisciplinary
- But—expertise on any particular specific topic is limited to two or three persons
- Study Sections have a SRA and a Chair
- Usually three primary reviewers and 2-3 discussants

Study Section-2

Triaging

- Initially, grants are reviewed and those with reviewers in consensus that funding range not likely to be reached are “triaged”
- About 40% of grants are triaged
- A grant may also be “NRFed”—Not Recommended for Funding—group does not want to see the application again

Study Section-3 Operations

- Begin with scores from the reviewers
- Then hear critiques from primary reviewers
- Then any additional comments from discussants
- Then open discussion
- Then return to scores of initial reviewers and discussants
- Then statement of anyone planning to vote outside the range

Study Section-4

Disagreements

- Novelty of work
- Feasibility
- Lack of scientific hypotheses
- Inadequate or inappropriate methods
- Cross-disciplinary conflicts—e.g., lab vs population perspective
- Public health importance

Study Section-5

Funding Level

- Funding itself is not a criterion for judgment—can't use the “F-word”
- Can make general comments about budget for NIH consideration
- Can make specific budgetary recommendations

Study Section-6

Scoring

- Everyone knows the payline approximately
- Scoring tends (too often to be dichotomous) F—not F
- Encouragement to use the full range—
- I push for giving good scores and bad scores

Study Section-7

Revised Applications

- Large proportion of applications are resubmitted—two revisions allowed
- Investigators offer a response to each point of criticism and indicate changes in the text
- The response should be respectful and accomodating
- Combative responses can seek a grant

Grantsmanship-1

- Good questions/focused testable hypotheses
- Clarity of presentation
- Consistency across grants—from hypotheses to analyses
- Honesty not subterfuge
- Make scientific/public health contribution clear

Grantsmanship-2

- Focused Background and Significance section with concluding section
- Give relevant Preliminary Results only
- Begin Methods with an overview
- End with consideration of limitations
- Do not exaggerate anything, but power in particular

Grantsmanship-3

Avoid

- “Unique opportunity”
- “First ever”
- “Largest ever”
- “important”
- And other exaggerations

Remember—“Good grants are
always funded”

Frank Speizer