

# What do you need to have in your grant application?

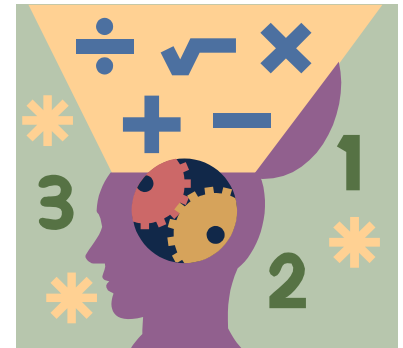
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# Review Criteria for Research Proposal

- Statement and Importance of Problem
- Research / Evaluation Design
- Analyses
- Research Personnel
- Schedule and Budget
- Ethical Issues
- Executive Summary



# **Statement and Importance of the Problem**

# Research Objectives:

1. Are the objectives **specific** and clearly stated?
2. Are the objectives appropriately inclusive?
3. Are the objectives **attainable** (in light of available measures, time, accessible population, resources, and/or the proposed PI of project)?
4. Will attainment of the stated objective contribute to **new knowledge** or needed understanding of the subject?
5. Has this work been done before?
  - a. If so, does the research need to be replicated?
  - b. If replication is needed, does the PI demonstrate why this is so?

# Relevancy:

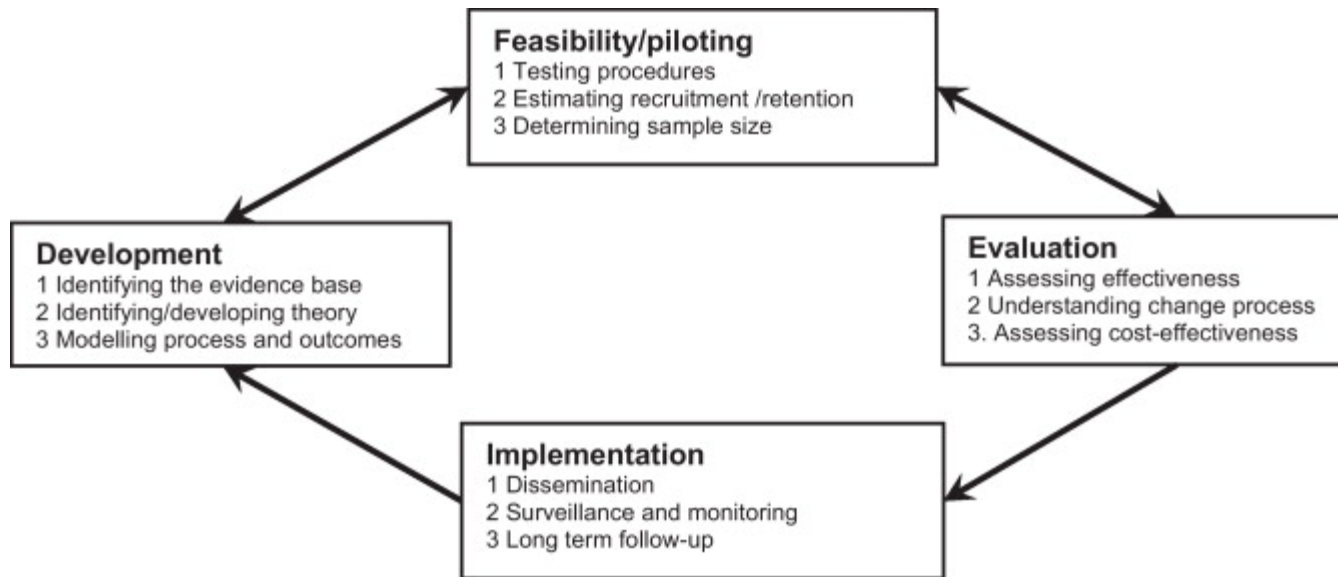
1. Are the objectives of the study consistent with the goals, objectives, and purpose of the funding agency?
2. If so, does the application identify how the results may contribute to the health services which the funding agency has targeted for its mission?

# Literature Review:

1. Is the literature review complete and up to date?
  - a. Are the important or major references included?
  - b. Have negative findings or competing hypotheses been reviewed and discussed?
  - c. Has important and relevant material been overlooked?
  - d. Does the review currently reflect the degree to which the area for study has been investigated (extensive / minimal)?
2. Does the literature review confirm that:
  - a. The proposal's research objectives are timely and needed;
  - b. The selected research design is justified; and/or
  - c. The PA is sufficiently knowledgeable of and up to date in the literature?

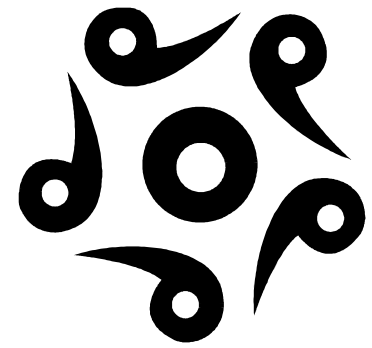
# Research / Evaluation of Design

# Medical Research Council Framework for developing complex interventions





# Type of Design:



1. Is the proposed type of investigation appropriate to the research objectives and the stage of investigation needed given our present level of knowledge?
2. Is the type of data specified and appropriate?
3. Are subjects from target population available and accessible?

# Type of Design:

2. If hypotheses are applicable:
  - a. Are they clearly and appropriately cited?
  - b. Are they consistent with the cited research objectives?
  - c. Will answers to the cited hypothesis provide the basis for achieving the research objectives?
3. Is the methodological design scientifically sound?
  - a. Is the level of rigor consistent with and appropriate to the proposal's objectives?
  - b. Is a less rigorous design justifiable, and if so, why?

It is now a requirement to include potential pitfalls and contingency plans in the application form.

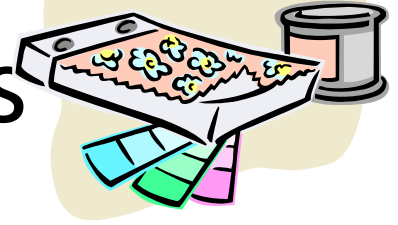
# For Both Prospective and Retrospective Data:

1. What evidence exists for the quality of the data in terms of its reliability and validity?
  - a. Are the proposed measuring instruments well known?
  - b. Are the instruments appropriate for achieving the objectives of the project?
  - c. Have these instruments been established as acceptable in terms of established reliability and validity?
  - d. Is there evidence that the research personnel can use the instrument reliably?

# For Both Prospective and Retrospective Data:

2. What steps are proposed to check for the data's reliability and validity?
  - a. Does the study propose to establish reliability and validity of new or modified instruments?
  - b. Is the type of reliability and validity being established optimal and appropriate?
  - c. Is there evidence that the research personnel can establish accurately the degree of reliability and validity of the data?
3. If the study is related to the assessment of an intervention protocol or the evaluation of demonstration / innovation project:
  - a. Are cost benefit analyses proposed;
  - b. is cost-effectiveness to be established; and / or
  - c. can cost-utilities be developed?

# Sampling Procedures



1. Have the sampling procedures been adequately described?
  - a. Have inclusion and exclusion criteria been clearly enumerated?
  - b. Are these inclusion / exclusion criteria appropriate given the background information, research literature, and objectives?
  - c. Should control groups be used?
    - If so, are the controls adequate and appropriate?
    - If matching is proposed, are the matching criteria appropriate (age, sex, ethnicity, social-economic status, health status, etc) and sufficient (over or under matched)?
    - If statistical standardization procedures are proposed, are the standardization measures (covariates) and statistical techniques appropriate and sufficient?
  - d. Have biases in cases (and, if applicable, control) samples been adequately identified and addressed (i.e. properly accounted for by elimination, control, and/or measurement and statistical adjustment)?

**ACCESS to population**

# Sampling Procedures:

2. Are sample sizes adequate in terms of numbers to establish:
  - a. prevalence / incidence or other such rates or estimates within acceptable bounds of precision; or
  - b. adequate statistical power for hypothesis tests?
3. Is the precision level or cited effect size justified by the literature, issues of substantial importance, and/or practical criteria (cost-benefit / effectiveness / utility, decision analysis, etc)?
4. Will sampling techniques enable:
  - a. generalizing results to target time periods and / or target populations,
  - b. appropriate and meaningful comparisons to be made?



# Analyses

# Is the basis of analysis to be the collected data and research of objectives?

1. If statistical analyses are needed:
  - a. Have the most appropriate models been proposed, given nature of the data to be analyzed, type of sample drawn, and the research question posed?
  - b. Are the proposed statistical analyses sufficiently comprehensive in scope?
2. If content analyses are needed:
  - a. Has the framework for content analyses been identified / described;
  - b. what steps are proposed to ensure classification consistency is established; and
  - c. have strategies been developed to reduce narrative, descriptive data to semi-quantitative measures for purposes of reporting and testing (e.g. enabling frequencies or rates of nominal categories, proportional tests / comparisons, etc)?



Have appropriate strategies been developed for handling missing data or missing subjects (noncompliant, lost to follow-up):

1. In the data collection phase,
2. In the analysis phase, and / or
3. In the interpretation phase?



# Research Personnel

# Description of Duties:

1. Are the duties and commitments of the professional personnel named on the study clearly described and assured?
2. Are research assistants necessary?
  - a. Are the duties of these personnel identified and defined?
  - b. Can the research team access such assistants (budgeted for, availability in the region, etc)?

# Appropriateness:

1. Does the PA appear capable of undertaking this project in terms of:
  - a. education, experience, research expertise (grants, publications, scientific presentations), and past research focus on his / her work.
2. Does the research team include the breadth of research and technical expertise needed?
  - a. Substantive expertise, and
  - b. Research expertise (methodological, statistical)?

## Consultants:

1. Are the consultants needed in this project, and if so, does the proposal recognise this need?
2. Is the budgeted consultant enumeration justifiable?
3. Are identified consultants suitable (knowledge of locale, expertise, stature of identified individual, etc)?



# Schedule and Budget

# Appropriateness of Time Schedule:

1. Has a time schedule been developed for all major phases of the study?
2. Is the schedule clear, realistic, and achievable?

## Budget:

1. Are personnel costs consistent with local remuneration levels?
2. Are budgeted items in supplies, equipment, and / or travel needed and justified?
3. Are budgeted statistical and computer services consistent with size of data files, proposal analyses, local computer costs?
4. Overall, is the size of the budget commensurate with the importance of the research?

# Ethical Issues

# Approval:

1. Has the application been reviewed and cleared by the ethics committee.
2. Has the proposal accounted for all possible problems in relation to:
  - a. Confidentiality;
  - b. Informed consent, and
  - c. Steps needed to ensure protection of participants with regard to disclosure, hazards, or other pertinent factors?
3. Has the PA sent the application to all applicable ethics committees for clearance?



# Executive Summary

Considering the detailed examination of the proposal, does the executive summary appropriately and adequately communicate the nature and purpose of the investigation?

# Helpful Hints, Guidelines, Principles in Preparing Grant Applications

- Anticipate Concerns / Questions.
- Assume the review process is a debate.
- Try to anticipate the question, or the concern, which your reviewer will think of when reading the grant,
- Succinctly allude to the question / concern in the grant and give the rebuttal, rationale, or answer before it can be raised by the reviewer.
- This tactic can leave the reviewer with nothing to state negatively (unless this anticipated rebuttal elicits a “rebuttal to the rebuttal”).
- Have your grant application reviewed by as many people as possible.
- Expect critique, not praise; develop an attitude that feedback now is essentially constructive, no destructive.

# Helpful Hints (cont'd)

- Don't ignore any comments, no matter how much you might feel they are misinformed, or how carelessly read the review has been;
- Use internal peer review (or something similar). If someone who's essentially on your side hasn't seen or understood your point clearly, then you have a problem with how the grant reads (i.e. how it's written, organized, and / or argues).
- “Driving a Camel Through the Eye of a Needle”.  
There are restrictions as to the number of pages. With so much that has to be covered and so little space to write it, the task seems to be an impossible fit.
- The only way you can meet all relevant review criteria, in 5-10 pages is to write, rewrite, rewrite, rewrite ... rewrite; and
- May sparingly use appendices for material that's needed to prove your point, but this additional information per se is not needed in the actual text of a grant.

# Recognise the Competition:

1. In each review cycle, there are more grant applications seeking funds than can be supported.
  - a. Thus a reviewer's tendency is to recommend turning down many applications, usually more of them than he / she will recommend be funded.
  - b. Those PI's which are recommended for funding will have known these above review criteria, and will have written their grants so the applicable criteria have been met.
2. Do not expect to be funded in the face of such competition, unless your grant is as well prepared.
  - a. Few can be successful if they start the exercise of grant preparation just 2 or 3 weeks before the deadline.
  - b. Few can do so by tackling the exercise single handedly: seek help, have an investigative team.

# Attitude and Realism:

There is no shame in trying and failing

a. Everyone gets turned down and so will you

b. The competition is getting better, research funding (world wide) is getting proportionately worse, the number of quality researchers is increasing, and local factors other than scientific merit and substantive significance also may exist as selection criteria.

# Attitude and Realism:

It may appear that the basic anatomy of a grant reviewer's mind has been built to 'kill' a grant

- a. This guide will fortify your academic life and help you survive the "warfare" of the grant application process.
- b. More importantly, if your research application meets these criteria, the project will be better conducted and will, more likely, lead to results that make substantive and scientific contributions to health care practice / delivery and health / clinical science.
- c. Thus, you are not at "war" with a grant reviewer, but in "competition" with other scientists for a limited pool of society's funds for research and development.

**Practice *will* make you successful**