



Preparing a good grant application

The Health Research Board (HRB) receives an average of 500 grant applications each year (this includes applications for fellowships, project grants, programme and equipment grants). The average success rate of these applications is about 25%. The purpose of this document is to help applicants prepare a good grant application. The document is meant as a general guide and not all of the points covered will be relevant to all HRB grant schemes.

Successful Grant Application

The ingredients of a successful grant application are good ideas, sound methodology and a clear, well written application. The proposed research should be based on a significant hypothesis or research question and oriented towards research for health and social gain, which includes basic and translational research, health services research* and practice-based research. Specific methods should be directly related to each aim of the project. Likewise, the specific aims/objectives should be related to each hypothesis. All aspects of the application should be clear and focused. It is best to define all assumptions, limitations, and alternative approaches. In general, the ideal approach is for the applicant to address all possible problems before the reviewers do.

How Grant Applications are assessed

Reviewers judge the strengths and weaknesses of research-grant applications by assessing how well it answers the following questions:

- Is the hypothesis valid?
- Are the aims/objectives logical?
- Are the procedures feasible, adequate, and appropriate for the research proposed?
- Is the research likely to produce new data and concepts or confirm existing hypotheses?
- What is the significance and originality of the proposed study in the research area?
- Are the principal investigator and the staff qualified to conduct the proposed work, as judged by their track record, demonstrated competence, academic credentials, research experience, productivity and publications?
- Are the facilities, equipment, and other resources adequate for the proposed work, and is the environment conducive to productive research?
- Is the proposed study cost effective?
- Is the project likely to lead to publications in international peer-reviewed journals or other publications?

In most grant application forms four key questions are posed:

1. What do you intend to do?
2. Why is the work important? - (i.e. describe the broader context)
3. What have you already done?
4. How are you going to do the work?

By comparing these questions to the headings found in an application form, one can readily see what is required:

1 AIMS/OBJECTIVES (What do you intend to do?)

2 SIGNIFICANCE (Why is the work important? Describe the background and put the proposal in context.)

3 PRELIMINARY STUDIES (What have you already done?)

4 RESEARCH PLAN (How are you going to do the work?)

In preparing the grant application, the applicant should ask him/herself the following questions:

1 AIMS:

Hypothesis:

Is the hypothesis valid and important in this particular sphere of investigation, and is it feasible to test this hypothesis using available methods?

Objectives:

Are the specific aims logical, carefully chosen, well defined, clearly stated and reasonable. What steps are going to be taken to achieve the aims?

2 SIGNIFICANCE:

Background:

Have I collected thoroughly, reviewed critically, and organised logically the data and events that led to the present proposal, and does this background information justify the next step, which is this proposal? Have I made a clear distinction between (a) what others/or collaborators have done, (b) what I have done, (c) what I intend to do?

Literature:

Have I demonstrated a thorough understanding and a balanced knowledge of the pertinent literature, and have I emphasised or clarified discrepancies?

Gaps to be filled:

Will the results of the research fill a defined gap in our knowledge or advance our understanding of this subject? Or will the research facilitate the development of valuable techniques or experimental models, lead to rational treatment for some pathological condition, or change existing practices?

Importance:

Is this research likely to yield new conclusions that will have general theoretical value or practical clinical significance, or impact on the delivery or organisation of practices or health services?

3 PRELIMINARY STUDIES:

Feasibility:

Have the preliminary studies demonstrated that the methods, procedures, techniques, and protocols are feasible, adequate and appropriate, and that the hypothesis is therefore readily testable?

Experience of investigator:

Does my professional background, research experience, past progress in the topic, knowledge of recent international developments in the field and preliminary experiments, as outlined in this application demonstrate that I am qualified to perform the study, that I have the technical competence and skills needed for the proposed work, and that my results will be reliable and inspire confidence in my peers?

4 RESEARCH PLAN:

Design:

Is the research plan original, appropriate, valid, carefully designed, straightforward, well organised, logically conceived and lucidly described?

Methods:

Are the methods robust and appropriate for the proposed investigation and are they described in adequate detail? Do the methods correspond to the specific aims?

- **Innovations:** Am I using innovative procedures to overcome difficult technical problems? Are these innovative procedures feasible and well within my competence and experience? Do I have evidence or modelling data to show that these new approaches are feasible? Do these new procedures have obvious and clearly described advantages over the standard techniques now in use? Have I provided pilot data if available?

- **Advantages:** Have I anticipated and adequately discussed potential difficulties and obstacles in the approach chosen? Have I carefully considered the advantages and disadvantages of each method?

- **Limitations:** Have I recognised the limitations of the methods and how these limitations can influence the analysis and interpretation of the results? Have I involved external collaborators where my research team has limited experience in the use of special methods?

- **Difficulties anticipated:** Am I fully aware of difficulties that may be encountered in the implementation of the research plan and of the specific methods? Have I convinced the reviewers that I will be able to circumvent anticipated, as well as unexpected difficulties or propose logical and appropriate alternatives to any methodological obstacles that might be encountered?

- **Sequence:** Have I developed my research plan in a carefully focused, step-by-step, ordered manner? Have I drawn up a good project management work plan indicating the feasibility of completing the project in the time-frame allocated.

- **Analysis of data:** Have I given careful attention to the type of results that could be expected, so that I can analyse only valid and relevant data? Have I provided an analysis to justify the sampling strategy and sample sizes with estimates of statistical power? Have I detailed the handling and analysis of the data in my application?

- **Interpretation of anticipated results:** Have I demonstrated an awareness of the underlying principles and the associated complexities of the area under study so that I can interpret my results appropriately?

It can also be helpful to seek a pre-submission review of the draft application by experienced colleagues, if time permits.

REASONS FOR REJECTION OF A GRANT APPLICATION

The following are the most common reasons why a grant application may be rejected:

- Absence of an acceptable scientific rationale
- Questionable reasoning in the methodological approach
- Lack of experience in the essential methodology
- Uncertainty concerning the future directions of the research
- Unrealistically large amount of work
- Methods not sufficiently detailed
- Uncritical approach
- Research problems: (a) hypothesis - ill-defined, lacking, faulty, diffuse, unwarranted (b) significance - unimportant, unimaginative, unlikely to provide new information for health or social gain
- Study design: (a) study group or controls - inappropriate composition, number or characteristics (b) technical methodology - questionable, unsuited, defective (c) data collection problem - confused design, inappropriate instrumentation, timing, or conditions
- Lack of new or original ideas
- Lack of knowledge of published relevant work
- Investigator - inadequate expertise, poor past performance or productivity on a HRB grant, insufficient time to be devoted to project
- Resources - inadequate institutional setting, support staff, laboratory facilities, equipment or personnel, restricted access to appropriate patient population
- Ethics - lack of awareness of ethical issues surrounding the research, or ethical issues not addressed.

The following are some general points to consider when applying for a grant, bearing in mind that a sloppily written application is always at a disadvantage:

- Use the right application form for the scheme, (forms change from year to year because of new regulations).
- Follow the guidelines given.
- Fill out the form in full.
- Make sure all of the questions are answered.

- List references using the format requested.
- Sign the appropriate forms if necessary.
- Justify financial support for personnel, consumables and equipment.
- The title should be concise and express in a line or two the essential goal of the project.
- In the case of on-line applications, allow sufficient time to prepare the application as the procedure takes longer than the conventional hard-copy system.

*For further information on issues such as study design and sampling, researchers working in health services research, epidemiology and public health might like to refer to *The Pocket Guide to Grant Applications* by Iain K Crombie and Charles du V Florey, published by the British Medical Journal and available from the BMJ Bookshop via the BMJ website.