

Research Proposal Writing: Breaking the Myth

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ABSTRACT

Background: Research is an essential activity required for the advancement of science and improvement of human existence. To carry out a research, a proposal is mandatory. However, in spite of the widespread demand for research proposals, experience has shown that a number of them are so poorly written that they are rejected by assessors. This article aims at assisting researchers develop acceptable research proposals by reviewing the different components of a research proposal.

Method: A review of relevant literature on research proposal writing sourced from manual library and internet search was used for this review.

Result: A research proposal is a formal and detailed statement of intent to carry out a research. It presents and justifies a plan of action and shows how the investigator thinks. A research protocol on the other hand is a plan written to seek approval for research from a supervisor or an organization. It is developed as a guide for a study and helps to keep the researcher focused on the topic and scope of the research. A research proposal has the following components: The Title page; The Abstract/Executive Summary; The Introduction/Statement of the Problem; Literature Review; Information on the applicant's centre; The Objectives/Research Questions/Hypotheses; The Study Design; Methods; Plans for Analysis; Data Analysis; Plans for Data Interpretation; Plans to report. Thus, although proposals and protocols are sometimes used interchangeably, a proposal precedes a protocol.

Conclusion: To reduce the time wastage and frustration faced by intending researchers and their assessors it is essential that good proposals be written at all times.

KEYWORDS: Research proposal writing; Useful hints.

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INTRODUCTION

Researches are conducted for various reasons which include responses to problems or a need to plan or change a programme or course of action, to test a hypothesis or to further study recent research findings. Researches are also conducted in response to

demands from public agencies or companies or because of the curiosity of the researcher. The conduct of a research may be a part requirement for obtaining a certificate in some educational programmes such as the undergraduate and postgraduate medical training programmes.

Although a number of potential researchers attend research proposal writing courses and have supervisors who review their write-ups, experiences have shown that a number of research proposals are often substandard and are therefore rejected by reviewers. Similarly a number of papers have been rejected by journals because the authors failed to comply with the minimum standards expected of the particular research. It is therefore evident that writing an acceptable research proposal/protocol is not as easy as is often presumed to be.

GETTING STARTED WITH A RESEARCH

A number of researchers have inertia in starting research work. Some of the areas of difficulties are in the choice of research topics and writing the proposal. In order to get started with a research you need to overcome some obstacles before you reach the stage of writing the proposal. These obstacles include:

The decision to start a research and implementing that decision: Researchers, irrespective of their experiences in the field of research often experience some initial problems with the decision to start a research work; younger researchers tend to face more problems. It is however important to note that these difficulties are not peculiar to researches only but also occur in other activities people want to be involved with. However, once the researcher has overcome this inertia, it becomes easier to think out research topics and start some work.

Having decided to start a research, it is important to determine to do the work to the end. There are a number of researchers who have abandoned their beautiful research projects because of some difficulties such as unexpected results, inadequate materials, etc. It is also common for researches that have received approval and sometimes funding to fail to get started on time because of some unexpected difficulties. These all highlight the need for proper research proposals so that

the researchers will be guided through the research irrespective of the difficulties they may face.

The choice of research topics

This is a common problem of researchers worldwide. In deciding on research topics, the following could be of assistance:

Determine the question your research will answer

Since all epidemiological studies aim to answer a question it is important to have a clearly defined question, which can be answered, before starting to plan a study. These questions usually arise from experiences and discussions with colleagues. Once you have decided on your study question, it is vital to review the published literature on the subject. The reasons for reviewing literature include to see whether or not the question has already been addressed by someone else and to see how other investigators have approached the problem.

Determine the relevance of your research subject to your population

It is easier for the sponsors and assessors to approve researches that are relevant to the needs of the great majority of the population. Some issues that may appear useful for research may be difficult to research into because the materials- clients and equipment- may not be available for use at that point. Researchers should always seek for topical and current issues in their fields of interest. There is need to read current journals, seek the opinions of others and consider your personal experiences on the issues at stake.

The areas of interests to the funding agencies/training programmes

Funding bodies and training institutions may set guidelines on their areas of interest. These should guide researchers in selecting their topics to facilitate the approval by these bodies.

Availability of resources to conduct the research

Researchers need to assess the availability of the materials such as personnel, time, clients, before embarking on specific researches. For example, to decide to study Computerised Tomographic (CT) findings in the brains of severely asphyxiated infants, although a researchable topic in which clients may not be a limiting factor in a developing world setting, the absence of the CT scan machine may prevent the research from being conducted. Similarly, although, it may be useful to recruit all under-fives in a particular

community to accurately determine their immunization status, the constraints of funds and time may make such a research, especially in a big city, impossible to execute. There may also not be enough manpower to collect and analyse the relevant data. Thus, one may be constrained to determine the minimum sample size and collect data on that sample. The resources also include the subjects to study. There may be no cases at a particular point in time for one to study.

Other issues to consider when choosing a research topic include personal observations and the need to introduce new methods and techniques of doing things. A researcher may also decide to follow-up other people's research in a particular setting.

A researcher may start the task of choosing an appropriate research topic by reviewing a number of publications in different fields, attending conferences, reading calls for proposals, etc. You may need to write a number of topics and with the aid of the above guidelines select feasible ones in a particular situation. Having selected an appropriate topic for the research, we shall proceed to discuss the components of a research proposal so as to guide the researcher in developing a proposal for the research.

WHAT ARE RESEARCH PROPOSALS AND PROTOCOLS AND WHY DO WE NEED THEM?

A research proposal is a formal and detailed statement of intent to conduct a research. It presents and justifies a plan of action and shows how the investigator thinks. A research protocol on the other hand, is a plan written to seek approval for research from a supervisor or an organization. It is developed as a guide for a study and helps to keep the researcher focused on the topic and scope of the research. Thus, although both terms are used interchangeably they are not only different but proposals precede protocols. The proposal is usually larger and encompassing and addresses the reason for the research and where the research proposal is being sent. A protocol however just focuses on the work. A research proposal helps the researcher to communicate a research plan to those who provide consultation, give consent or disburse funds; plan for action and also serves as the terms of contract for the particular research. Since the proposal is an agreement between sponsor and researcher, no fundamental terms of the contract can be changed by unilateral decision.

THE COMPONENTS OF A RESEARCH PROPOSAL

There are variations in the formats of research proposals. These formats are determined by those

requesting for the research such as supervising institutions or organizations. Thus, different departments, universities and postgraduate medical colleges have formats that may differ from each other and from those of companies and international agencies such as the World Health Organisation or the United Nations Children's Fund. It is therefore essential to know the format required by those to whom your proposal is being submitted so as to present a document that meets their specifications and increase the chance of your proposal being accepted.

Most research proposals however contain the following components: The Title page; The Abstract/Executive Summary; The Introduction/Statement of the Problem; Literature Review; Information on the applicant's centre; The Objectives/Research Questions/Hypotheses; The Study Design; Methods; Plans for Analysis; Data Analysis; Plans for Data Interpretation; Plans to report Research Findings; Logistics; Work Schedule or Time line; Conclusions; Bibliography; and Appendices.

The Title Page

This contains the title of the project and the personal data of the researcher(s): the name(s), title(s), organization(s), address (es), phone and fax number(s), and E-mail address (es). These are to aid communications between the funding agencies/supervisors and the researchers. The title of the project should be carefully selected so that it describes exactly what is being intended. It should neither be too long nor too short.

The Abstract or Executive Summary

This is a summary of what is contained in the proposal. **It gives the reader an overview of the whole proposal before each section is considered in detail.** Although it appears first in the proposal, it is written after all other parts have been written. It should be brief. **It enables the researcher to get to the heart of the matter and sift out extraneous materials from the essential facts, in order to highlight only the salient points of the research being proposed.** Some organizations specify the number of words it should contain: usually 100-250. It should answer as many questions as possible such as; what problem is to be studied, what the research questions or hypotheses are i.e. the research goals and objectives, and the expected implications of the study. It should also address who will conduct the study, when the study will be conducted, where the data collection will be carried out, the methods that will be used to collect and/or analyse the data and what resources are

required to carry out the research.

Introduction/Statement of the Problem

The statement of the problem shows clearly what is intended to be addressed in the course of the research. It helps the researcher to think about their potential causes. To make a clear statement of the problem, there is need to also seek the opinions of others about it and search the literature and other sources to know what has been known about the problem. During these searches, the researcher gets to know what has been done on the subject and its scope so as to decide on what exactly he/she wants to do. The researcher also identifies the shortcomings of previous studies, areas where no work has been done and areas where work is currently being done. The literature on the subject should be classified so as to identify critical areas for research.

Formulating the statement of the problem is the most important and first step in carrying out a research. It influences all other steps in the research proposal and determines the resources needed to conduct the research. The details however depend on the type of research being conducted. However, a typical statement of problem will contain information on the problem being researched, background information about the problem and major factors influencing it, what has been tried in the past and what information your research will contribute to what is already known about the problem. Also, information on the factors influencing them and the potential solutions to the problem (Hypothesis) should be provided.

Literature Review

This addresses issues relating to what has been done in the past in relation to what is being studied, how it was done and what the strengths and weaknesses of these researches were. It helps the researcher to define the research problem and justify the research.

Definition of the Research problem: In defining the research problem you summarise the current research and list issues needing further study. Problem definition should provide information on the magnitude of the problem such as the incidence or prevalence of the problem, the time frame as relates to when it occurs and if it is current, the geographical area where problem occurs, the population affected and why it is peculiar to them i.e. their characteristics. Furthermore, it should state why the problem occurs and probable reasons for the problem including the existence of agreements or conflicts over these reasons, the solutions that have already been tried and how successful they have been

as well as untried solutions that might be available. Finally, it should put forward unanswered questions, i.e. state what parts of the problem need further research. For example, for an analytical epidemiological research, problem identification will fulfill the following conditions: Indication of the discrepancy between the real (or observed) situation (what is) and the ideal, desired or theoretical situation (what should be); indication of alternative solutions or explanations for the discrepancy and indication of which of the alternatives the researcher believes is the most likely to be correct and why. For most exploratory or descriptive studies only the first condition applies, the second and the third may or may not be applicable.

Justification of the research

Researches are costly and time consuming. Consequently research funding agencies want to appreciate the reason why the research should be done. This is called the justification of the research. In writing the justification for a research, answers to the following questions should be provided:

- ? Is the problem a current and timely one? Current problems are more likely to receive funding than past ones.
- ? Does the problem have life threatening or serious morbidity consequences?
- ? Does the problem affect or potentially affect a large number of people?
- ? Does the problem relate to ongoing programme activities? The research must have relevance to current programmes
- ? Does the problem have broad social, economic, political or health implications? For example the use of non-medical personnel to provide oral contraceptive services will increase its use and lower maternal mortality with broad based impact on the health, social and economic lives of the people.
- ? Is the problem viewed as a concern by many different people? A problem that evokes a widespread concern from administrators, politicians, health professionals and the general public is more likely to receive funding than one that is of concern only to a small minority.
- ? Have studies already addressed the problem? Problems that have been extensively studied in the past may not be favoured like ones that have not been so extensively researched.

The focus and scope of the project should comprise the usefulness of the research, its feasibility, the available resources and time available.

Information on the centre where the research is to be carried out

This should describe the centre where the researchers for the study work. If similar works have been carried out in the centre in the past, it is essential to refer to them. The essence of this is to establish the fact that the manpower and infrastructure already present are adequate to allow the research to be executed at that centre.

Objectives /Research Questions and hypotheses

Objectives: These describe why the research is being carried out and its relevance to the setting or the sponsors. By convention, objectives are more specific than aims. They give more detail about what the study proposes to investigate. They describe what will be demonstrated, tested, evaluated, confirmed, or compared, during the research. They communicate what the researcher plans to do, who will do it, to whom it will be done, when it will be done, where it will be done and what you hope to learn from the research.

Additionally, other objectives which should be incorporated in all researches include making recommendations to appropriate authority on what can be done and also working with them to utilize the knowledge gained from the study to improve the wellbeing of the society.

Research objectives help researchers focus on what has been discussed in the statement of the problems. Good research objectives make the work easier to accomplish and evaluate. Research objectives could be written to indicate the long term (broad objectives) and the short term (specific) ones. For example, in investigating the problem of *Low Primary Health Care facility utilization in a local government area*, the long term/general objective is *to identify the causes of low PHC utilization and offer appropriate solutions*. Ultimate goals are stated in terms of the potential impact or public health purpose of the study on service delivery. The goals must be clear and stated in terms of the broad social, economic or health concerns, change in policy decisions, service delivery programmes or individual health behaviour and populations that may be affected. Importantly, the quality of the objectives should be assessed. They should deal with all aspects of the said problem, be clearly phrased and easy to understand and expressed in operational terms that are easily measured. In addition, the objectives should indicate where the work will be done and include recommendations on how the research results will be used to solve the problem.

After developing the objectives, the title of the project

should be reviewed to see if it needs modification to reflect the objectives.

Research Questions and hypotheses: All proposals should contain a formal and explicit statement of the research question(s) to be studied or the research hypothesis (es) to be tested. Whether to use questions or hypotheses depends on the type of research: for example- exploratory or descriptive epidemiological research does not involve hypothesis testing: it is based on underlying questions. The research question must be stated with clarity, specificity and appropriate inclusiveness.

The research objective can also be written in the form of hypothesis or question. A hypothesis is a prediction of the relationship between one or more factors and the problem under study which can be tested statistically using the Null hypothesis: for example: A hypothesis that *Delay in the treatment of children with fevers is more in villages with no patent medicine vendors* can be investigated. The design of the study is to compare 2 villages: one with and another without patent medicine dealers to see if there is a significant difference in the timing of the treatment of children with fevers. If there is, the null hypothesis will be rejected and an alternate hypothesis that *Patent medicine dealers are useful in the treatment of children with fevers* will be accepted.

Study Design

This is a method by which the research questions can be answered. A survey design provides a quantitative/numeric description of some fraction of the population (sample) through the data collection process. The primary purpose of the research usually determines the research design. The study can be observational or interventional (also called experimental study). An observational study is one which describes the pattern of a health event in a population without doing anything to change the factors which influence them. An intervention study is one that is designed to test a hypothesis by modifying an exposure within the study population. An observational study can be descriptive or analytic while the intervention study is mainly analytic (figure 1). **A descriptive study** is one aimed at providing additional information before a hypothesis can be formulated. Descriptive studies provide accurate baseline data on the occurrence or prevalence of a characteristic or event related to a health problem, and on the people who are affected and how they are affected. **Analytic or exploratory studies** are used to explain the relationship between two or more variables by testing the causal hypothesis that specify the relationship

between variables.

The study designs that can be used for these researches include:

Cross sectional design: Current or prospective information collected at one point in time from a sample of subjects from the target population. This design is appropriate for descriptive purposes because it does not always lend itself to temporal arrangement of independent and dependent variables.

Cohort Design: Information is collected on the study population at one point in time; then at a latter point in time the subjects are examined again to measure the outcome of interest. The temporal aspect of this design makes it most appropriate non-experimental design for analytic epidemiologic research.

Case-Control Design: This is typically a retrospective design that compares a group of cases and controls to examine the effect of a current or previous risk factor. The case-control design may also be a prospective design in which cases and controls are enrolled prospectively soon after a health problem is diagnosed or identified. The design is used for descriptive and analytic research purposes; it is especially useful if the outcome or dependent variable is a rare event.

Experimental design (randomized clinical trials): The researcher manipulates the independent variable or study factor and controls allocation of subjects to the exposure under study. This design is ideal for analytic epidemiologic research.

METHODS

Epidemiologic research involves a careful and systemic observation of people (subjects) and events. The methods used for such observation may affect the quality of the data. It is therefore essential that the researcher provide a detailed description of how the subjects will be selected and the data collected. Although the contents vary depending on the purpose and design of the research, the methodology should specify the study population, the type of data to be collected, the data collection and quality control procedures. The Methods section should present step-by-step instructions for carrying out the research. The outline is as follows:

Definition of the population: The researcher has to define the study population: -age, sex, residence, socio-economic status, political and other demographic identifiers etc.

Description of the sampling process: A sample is a fraction of the population selected for a study. It must be representative. The sampling unit must be determined: -individuals, schools, villages, etc. A number of issues

should also be considered when describing the sampling process. The number of people required for the study should be specified using sample size calculations. In selecting the sample, the type of sample should be identified using simple random, systematic, cluster, multistage, or non-probability sampling methods. This has a lot of impact on the study and it must be properly selected. If the population needs stratification, the differences in the gender, socioeconomic and educational levels of the population should be put into consideration. The procedure for collecting the sample- and the sampling frame must be clear and accurate. The sampling frame involves listing all the population in the study. The random assignment procedure for clinical trials should also be described.

Definition of the type of data to be collected: This involves defining the cases, controls and comparison groups. All variables which could be independent, dependent, exposure, treatment, outcome, confounders and effect modifiers should be listed. The conceptual and operational definitions should be stated.

Description of the data collection procedure: There are different methods of data collection which include structured or unstructured interview, focus group discussions, self-administered questionnaire, direct observation of behaviour, service statistics, medical chart review, vital records, census data, or other secondary sources. Any method used should be well described. A description of the data collection instrument e.g. questionnaire, medical records abstract form, etc should be done. A first draft of the data collection instrument is typically developed after the research project has been approved. The proposal may indicate that individuals with experience in developing and using similar data collection instruments will be asked to critique and improve the draft. Other aids for developing a questionnaire may be mentioned (e.g. focus groups for clarifying concepts and terminology). If the research is using a preexisting instrument, a copy may be appended to the proposal.

Ethical considerations: This involves the consent of participants and how they will be obtained, the confidentiality of the data and how it will be maintained, and the review of human subjects, if this is applicable. These ethical issues are resolved by the Ethics Committee (EC): The committee's central principle is to ensure *respect for the dignity of persons*. The Committee reviews the proposal before the start of the research and follows up the research to ensure compliance with the proposal. To request the EC to review a proposal, required numbers of the copies of the detailed proposal are submitted to the Secretary of the

Committee for distribution to the members. The material is read and its suitability for approval is reviewed with the following considerations in mind; the scientific design and conduct of the study, the recruitment of the research participants, the care and protection of the subjects, the protection of the participant's confidentiality, how informed consent from the participants is secured and community considerations. When a research is considered acceptable, the secretary writes the researcher informing him of the approval for the research to start. The researcher is however expected to keep the committee informed about the progress of the research. Where a research proposal is not approved by the Committee, the reasons for that decision are clearly communicated to the applicant. When mailing a research proposal, a copy of the approval letter from the Ethics Committee and the informed consent form, if necessary, should be included. The confidentiality of the participant and how it will be maintained should also be indicated and the procedure for the review of human subjects involved in the research.

Description of the procedures used to control the quality of the data: The research proposal should include a discussion of any activities that are planned for maximizing the validity and reliability of the data. These include:

? **Pre-testing the data collection instrument.** Field testing the data collection instrument on a limited basis in an area outside the study area (or without involving the study subjects). All study procedures should be followed, including sampling, data collection (e.g. interviewing), supervising, coding, data entry, editing, and a limited analysis. Pre-testing is useful to modify the data collection instrument as well as other data collection procedures.

? **Re-interviewing subgroups of respondents:** This is a common technique for testing the reliability of the instrument.

? **Training interviewers and supervisors for data collection:** This ensures that all interviewers and supervisors are adequately prepared to obtain reliable data. Initially data collection teams should be closely observed by field coordinators or supervisors. Often times data collection may not go as planned and a number of problems affect the reliability or validity of the data. When problems arise, the interviewers consult the coordinator or supervisor so that the decision on how to proceed will take into consideration the impact(s) of such decisions on the entire study.

? **Description of the plans for data control.**

Meticulous attention to detail is required on the part of the supervisors so that all forms are completed according to pre-designated specifications, errors are corrected and no forms are lost. The forms should be sent to a central location where they are counted and processed for tabulation.

- ? **Indication of multiple sources of information.** For example, an interview may be augmented with an examination of the medical records to obtain a medical history. More than one source for the same information provides an excellent opportunity to check the validity of the primary source.
- ? **Description of other quality checks.** For example: more than one question may be structured to ask the same question from an interviewee. Responses to these questions can be compared for consistency.

Plan for data analysis and the analysis of data:

Analysis of data provides answers to the research questions. All proposals for epidemiologic studies must contain plans for analysis of the data. The analysis plans and data collection are so interdependent that they cannot be defined separately. Although the analysis depends on the type of data collected, how data are collected depends on the type of analysis anticipated. Sample size for example is a function of the type of analysis that will be performed. The analytic needs determine the sampling design. The analysis plan should include plans for data preparation as well as data analysis. The steps for data analysis include:

Preparation of the data: Before the actual analysis, the data must be checked for errors and put into a form that will allow it to be manipulated accurately and efficiently. The forms include:

Tabulation: It should be indicated whether the data will be tabulated by hand, computer or other method.

Coding: The process of coding translates verbal responses into numerical codes that will facilitate data manipulation. It should be indicated whether coding is necessary and who will do it. If any of the key variables in the study are obtained with open-ended questions, the need to code the responses to these questions may be mentioned.

Editing or cleaning the data: Editing ensures no question on the questionnaire is omitted erroneously, that no illegal codes have been used and that illogical inconsistencies in recorded responses are noted. Data may be edited in the field during the collection phase or in a central place or office after the field work is completed. Data may be edited by manually reviewing

the questions or forms on which responses were originally recorded, by using computer programmes that find errors and inconsistencies in the data, by reviewing tabulations produced by the computer. Computer editing may be structured to check each record as it is entered into the computer (this may be done in the field) or after all the records have been entered into the computer. The proposal should briefly state how the editing will be carried out.

Analysis of the Data: This may involve a combination of any of the following:

Variable transformations: These may include:

- ? Collapsing response categories for a particular variable into broader ones (e.g. age may be recorded by single years but collapsed into five year age groups for a particular analysis).
- ? Creating new variables (e.g. create a variable denoting premarital conception by comparing age at marriage with the age at the birth of the first baby).
- ? Counting the responses to a number of questions (e.g. creating a score that indicates the number of correct responses in a set of true or false questions)
- ? Constructing a scale or index that combines the responses to two or more questions (creating a socioeconomic score using mother and father's education, father's occupation and family income)
- ? Creating temporary mathematical transformations by converting original numerically scaled values of a variable to a different scale (e.g. square root, quadratic, or logarithmic) to better meet the assumptions of a particular statistical method.

Descriptive Statistics: Descriptive statistics are used to describe data quantitatively. They may be univariate, bivariate or multivariate. Univariate statistics include proportions, percentages, ratios, frequency distributions, and any graphic presentations. Other univariate descriptive statistics measure central tendency (e.g. mean, median, mode), decile, quartiles, and measures of dispersion (e.g. range, mean deviation, standard deviation, coefficient of variation). Bivariate and Multivariate statistics are used to describe the association between variables. They are called measures of association and include lambda, gamma, Pearson's correlation coefficient, relative risks, odds ratio, and others.

Even if the research objective is to test a hypothesis or generalize sample characteristics to a target

population, a description of some basic quantitative characteristics of the sample may be of interest. Descriptive statistics are particularly useful when reporting study results that involve the total population instead of a sample.

Inferential statistics: This allows conclusions from a sample to be applied to the whole population in epidemiological studies of samples of the population. If a study is based on a sample, descriptive statistics which describe the characteristics and associations in the sample should not be used alone but in combination with inferential statistics. Inferential statistics estimate the effect of sampling error on the ability to infer population characteristics and associations from sample findings. Measures used in statistical inferences include confidence levels, confidence interval intervals, and tests of statistical significance.

Table shells: A table shell contains all elements of a data analysis table except the data. The construction of table cells has been found to be useful to researchers in planning the data collection instrument and in visualizing how the data will be organized for analysis. Table shells may be included in the proposal or in an appendix.

Plans for data interpretation: Although data have not been collected or analysed yet, the literature and study design provide guidelines and constraints for interpreting the results. The proposal should describe plans to interpret the results. Considerations include the generalisability of the results, the limitations and potential contributions. The generalisability of the results is a function of the sampling and analysis procedures. The proposal should indicate the target population and any other populations (in time or space) to which the result can be generalized.

No study is flawless. All studies have some weaknesses, for example, in some sample selection, questionnaire design, measurement, or analysis could have weaknesses. It is the task of the researcher to keep these weaknesses at a minimum, to identify the limitations that do exist, and to inform the reader as to how the limitations preclude the generalisability or how the problem may be overcome in future studies.

The proposal should also discuss the merits of the study, such as timeliness, public policy implications, contribution to scientific knowledge, and public health contribution.

Plans to report research findings: The proposal should indicate what reports and other means of disseminating research findings are planned. Any of the following means is appropriate for disseminating the results of the study: progress reports, final reports,

publications, seminars, workshops and conferences, and discussions with policy makers and programme managers.

Some of the questions that should be addressed when discussing dissemination of study results include; what specific parts of the research or data will be covered, the stage in the study when the results will be written and who will write the results, how much time will be required to prepare the materials and who will receive these materials.

Logistics: The logistics are resources, personnel, facilities, and budget required for study. The proposal should indicate the anticipated cost of the study, the source of these funds, and how these funds will be allocated. A description of the resources and facilities available for the study should be specified. For example, computer facilities, secretarial assistance, office space, library facilities, and vehicles. Indicate whether other institutions will contribute resources and what proportion of the investigator's time will be devoted to the study (e.g. 100%, 60%, 20%). Many funding agencies prefer joint research projects and look favourably to proposals that show contributions from the applicant's home institution or organizations.

Any anticipated difficulty in obtaining scarce professional skills should be stated. Consultants or an advisory committee might be used if this need exists.

A brief management plan that indicates who will be responsible for the budget, staff, field operations, data processing, analysis, and other components of the project. If several departments or institutions are collaborating on the project, indicate who will have overall responsibility for the project and what would be the roles or contributions of the different departments or institutions.

A clearly outlined realistic budget that lists each cost item and its components. All costs involved in the research should be identified but it must be appreciated that some funding agencies have different rules for what they will fund in a research. The cost items should be arranged under major headings including salaries and benefits for personnel, supplies and equipment required, transportation needs and miscellaneous costs. Salaries and Benefits for research personnel which include Project Director, Researchers, Consultants, Field Supervisors, Interviewers, Computer Programmer, Key punchers and coders, Clerical staff, and Other staff as need arises should be specified. The equipment and supplies needed may include forms for reproducing questionnaires and other forms, office supplies, telephone and mailing costs, computer time or purchase, report printing and distribution.

Transportation needs should be limited to what is essential and may involve travel necessary to complete the study and follow up study participants and to initially distribute the results. These costs might include; vehicle rentals, fuel and lodging for interviewers during field work. The miscellaneous costs should be separated by year if the study will last longer than a year. Also if the study will have a long duration, a timeline for inflation should be included in the budget.

The justification of the budget is required by most funding agencies. It is important to relate the total budget to the number of subjects to be included in the study. Agencies may compare the cost per person included in the study to the same or other comparable projects carried out in different centers. The budget should therefore be very realistic.

Work schedule or timeline: The steps and their entire sequence in the research process should be outlined. A corresponding calendar should indicate the amount of time each step will require. The steps might include: Selecting the sample; Drafting the questionnaire; Training interviewers and supervisors; Pre-testing the questionnaire; Revising the questionnaire; Printing the questionnaire; Carrying out the field work (interviews); Coding the data; Key punching the data; Editing the data; Tabulating the data; Analysing the data; Writing the final report; Printing the final report and Presenting the research findings at a conference.

Bibliography for the proposal: The proposal must contain a bibliography which contains all the sources cited in the text of the proposal (these citations will be found primarily in the problem identification or in the literature review. Important references that were not cited in the text may also be listed in the bibliography, including methodologic sources. Any reference style can be used but it must be consistent. Every reference should be checked against the original publication to ensure correct information.

Appendices to the proposal: Appendices are part of the proposal and should be included. They may include the curriculum vitae of the principal investigators, information on institutional affiliation of researchers, sample of data collection instrument, Ethics Committee's approval, informed consent form, letters of endorsement for the study and other information relating to the study.

Conclusion: This reiterates the research goals and objectives to underscore the importance and relevance

of the expected outcomes to the society.

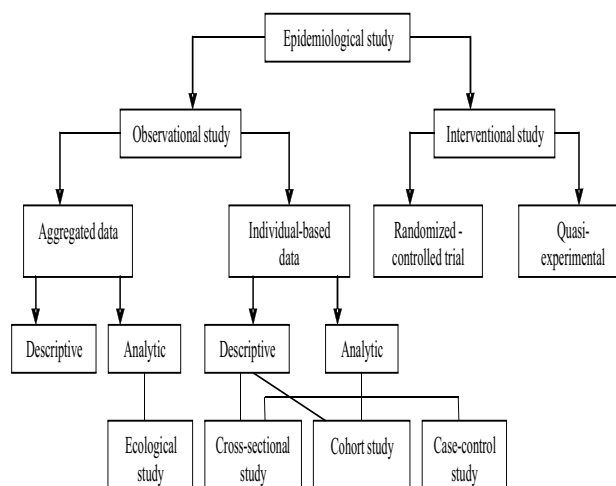


Fig. 1. Types of Epidemiological studies

CONCLUSION

Research is expensive and time consuming. The output depends on the quality of plans made before and the quality of the execution of the research. There is therefore need to carefully consider all that is involved in writing a research proposal and painstakingly working on each aspect so that the proposal will meet the requirements of sponsors/supervising institutions.

REFERENCES

1. Wingo PA, Higgins JE, Rubin GL, Zahner (Eds). An Epidemiological Approach to Reproductive Health (Centre for Disease Control, Family Health International, World Health Organisation). Atlanta Georgia, USA. Family Health International; Research Triangle Park; North Carolina, USA and WHO, Geneva, Switzerland. 1991.
2. Applied Diarrhoeal Disease Research Project: Harvard University. Harvard Institute for International Development in collaboration with John Hopkins University School of Hygiene and Public Health and The New England Medical Center Hospital and the Health Research Unit, Ministry of Health Ghana.
3. Federal Ministry of Health: National Primary Health Care Development Agency of Nigeria: Research Proposal Form.
4. World Health Organisation: Preparing a Research Project Proposal: Guidelines and Forms. (Second Edition, 1991). (WHO/HRP/PP/1991).
5. World Health Organisation. Guidelines for Ethics Committees. Geneva, 2000.