

Post Doctoral Research Fellowship

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DUT, Steve Biko Campus

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Basic steps of a research project

- Find a topic → **What, When**
- Formulate questions → **What, Why**
- Define population → **Who, when**
- Select design & measurement → **How**
- Gather evidence → **How**
- Interpret evidence → **Why**
- Tell about what you did and found out

Steps in the research process

- Establish needs
- Define problem
- Establish research objectives
- Choose design
- Identify information types and sources
- Choose data collection methods
- Design data collection tools
- Decide sampling strategy
- Collect data
- Analyse and interpret data
- Present research report

Planning your research:

Key questions

- What do you want to know?
- How do you find out what you want to know?
- Where can you get the information?
- Who do you need to ask?
- When does your research need to be done?
- Why? (Getting the answer)

How to transform a research idea into a research problem?

Step 1:

- Read as much as you can about your research idea. The main objective of first scanning of the literature is not much to learn about results of previous studies or what methodologies were followed, but to learn about the different ways in which this subject has been studied.

Step 2:

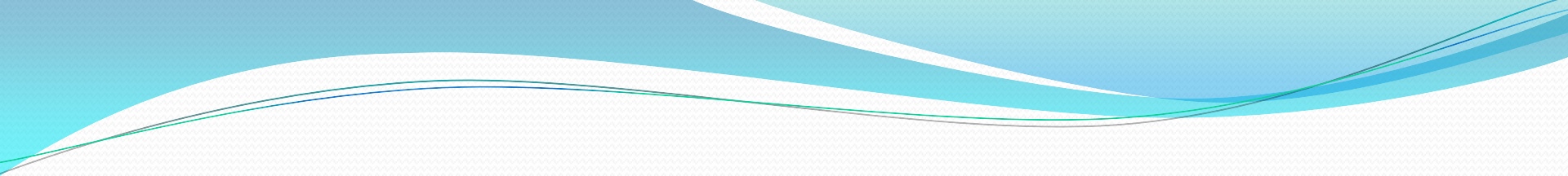
- Be clear about what you want to research

Step 3:

- Be clear about the objectives of your research. What are the general aims of study. Also give specific objectives

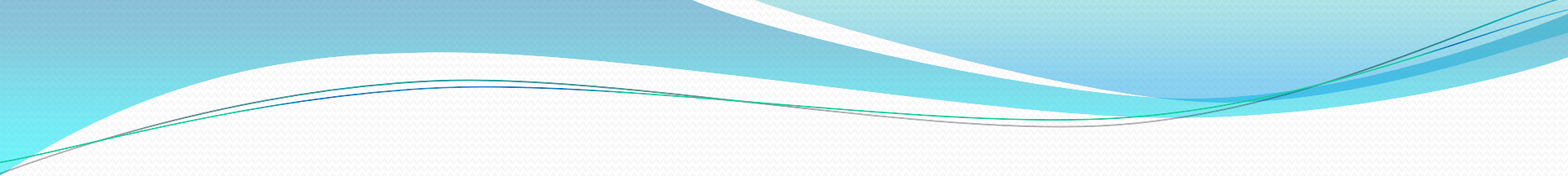
THE RESEARCH QUESTION

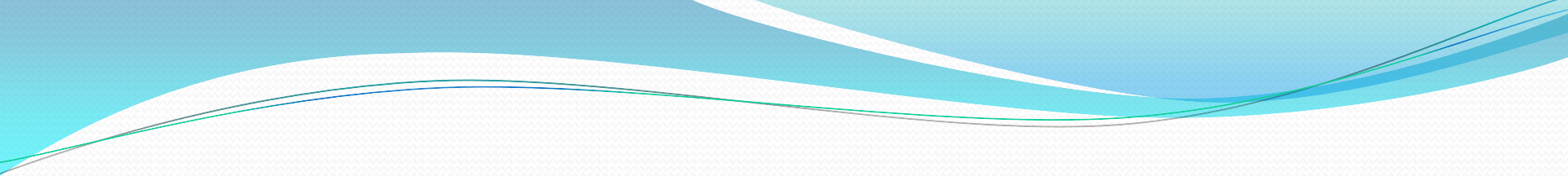
- Well, first you need a clear *research question*. Researchers get their research questions from many different places.

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- **Observation of the world**
 - Often a researcher will notice a peculiarity in her/his world and starts to wonder about it. Sometimes this produces a research question.

Previous research

- No study ever answers all the questions that we want to ask about a particular subject.
- New research findings nearly always inspire new research questions.
- Sometimes, it is because these findings are surprising, or because they conflict with existing theory, or other research findings.

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- *Practical concerns*
 - Very often researchers will be confronted by a problem in their own lives or become aware of the problems facing other people in their community.
 - Much research is aimed at solving immediate problems in the world.

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- **Personal interest**
 - Researchers have their own special areas of interest which inspires their research topics
 - The increasing rate of HIV infection in Southern Africa has challenged researchers to develop most effective strategies for changing human sexual behavior

Criteria for a good proposal

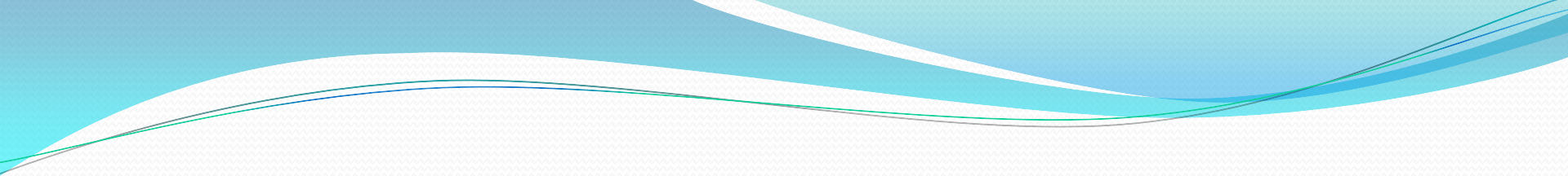
- Feasible:
- Adequate number of subjects
- Adequate technical expertise
- Affordable in time and money
- Manageable in scope
- Interesting

Expect...

- ... to make mistakes and to learn.
- ... to write and rewrite your research proposal several times!
Nobody gets it right the first time!
- ... to spend many hours reading books and journals relating to your topic!
- ... to spend many hours discussing your research with other researchers or your supervisor if you have one.
- ... to have your work criticized.
- ... to feel confused and perhaps even hopeless at times.

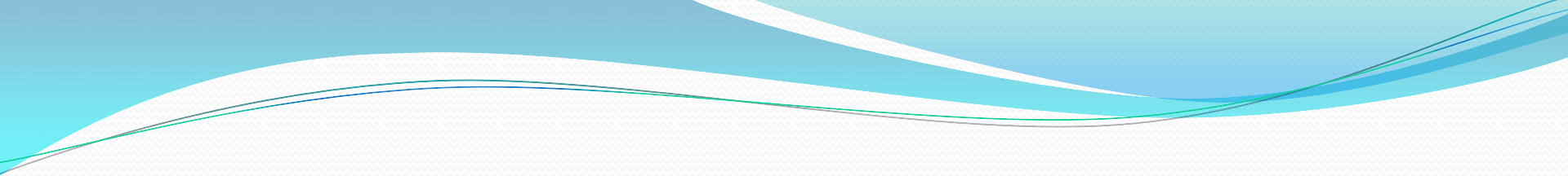
How do I choose?

- How might answering the question advance human understanding of the topic?
- How might this research contribute to research methodologies used in the area?
- How might research on this question find direct or indirect application?

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- How interesting is the question to you?
 - Do you have the skills (or can you develop them) to find an answer to the question?
 - Do you have the necessary time, financial support and equipment to find an answer to the question?

DESCRIBING A RESEARCH PROBLEM

- This research project explores the extent to which vigilantism is growing within different sectors of the South African population.
- In particular the research focuses on factors which promote and maintain vigilantism in our society.

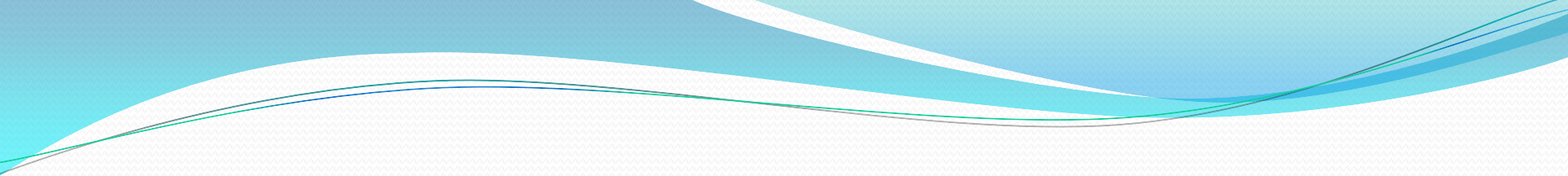
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- *Where does this research question come from?*
 - If it arises out of a debate in the literature, introduce that debate.
 - If it started with a request from a particular community, describe that community and the problems confronting it.

OBJECTIVES AND AIMS

- **The Problem Statement**
- Sets the scene for proposed study
- Should be clearly stated so that anyone can understand it
- Is usually stated in a complete grammatical sentence
- States the relationship between variables in the problem.
- Defines the goal to be achieved

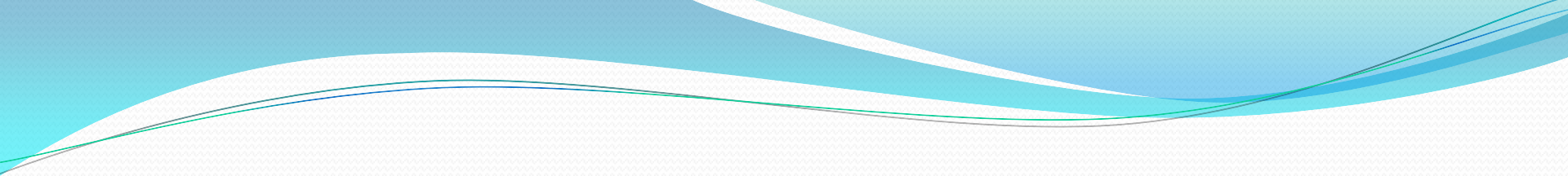
Aims/objectives

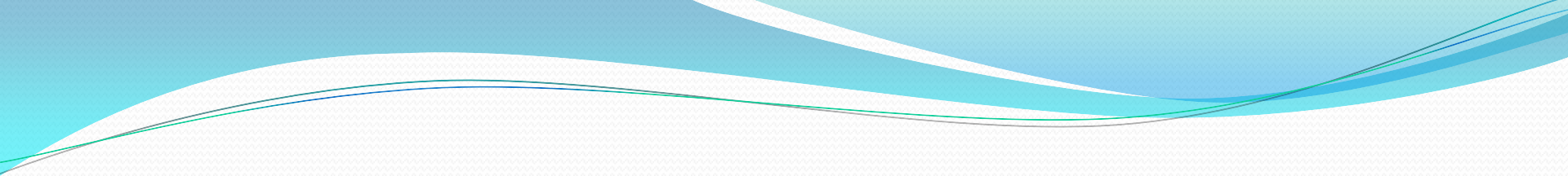
- It is a clear statement of the specific purpose of study, which identifies key variables and their possible interrelationships and nature of the population of interest.
- Most problems are too large or complex to be solved without subdivision.

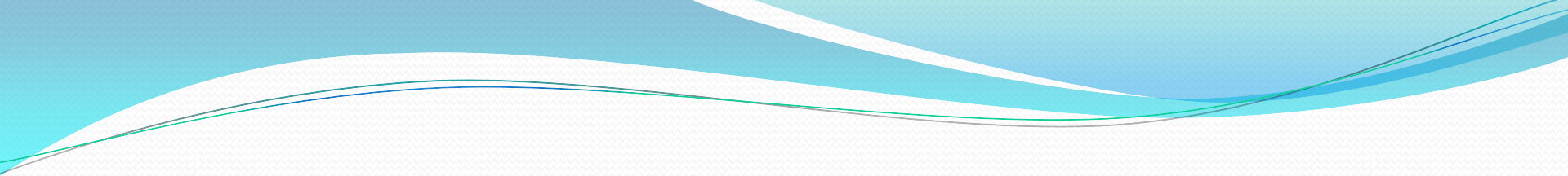
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- The aims are smaller, discrete units of the problem and from a research point of view these units are easier to comprehend and resolve
 - Each aim should be a completely researchable unit
 - Words like “evaluate” and “determine” are commonly used in the aims.

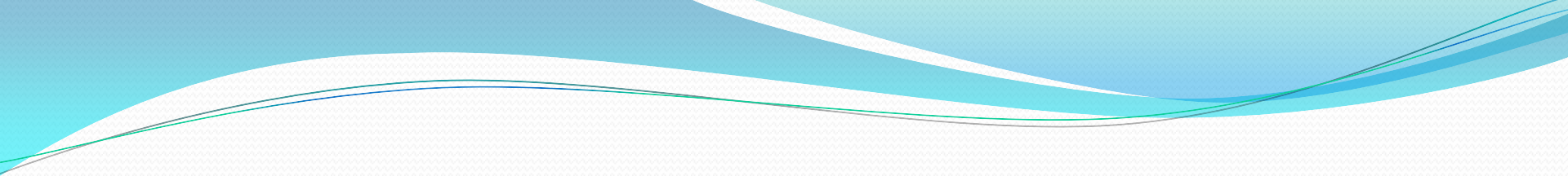
The why game

- 3-year old Siphon plays in stagnant water
- gets diarrhoea
- mother tries to care for him at home giving an enema
- Siphon dies on the way to hospital

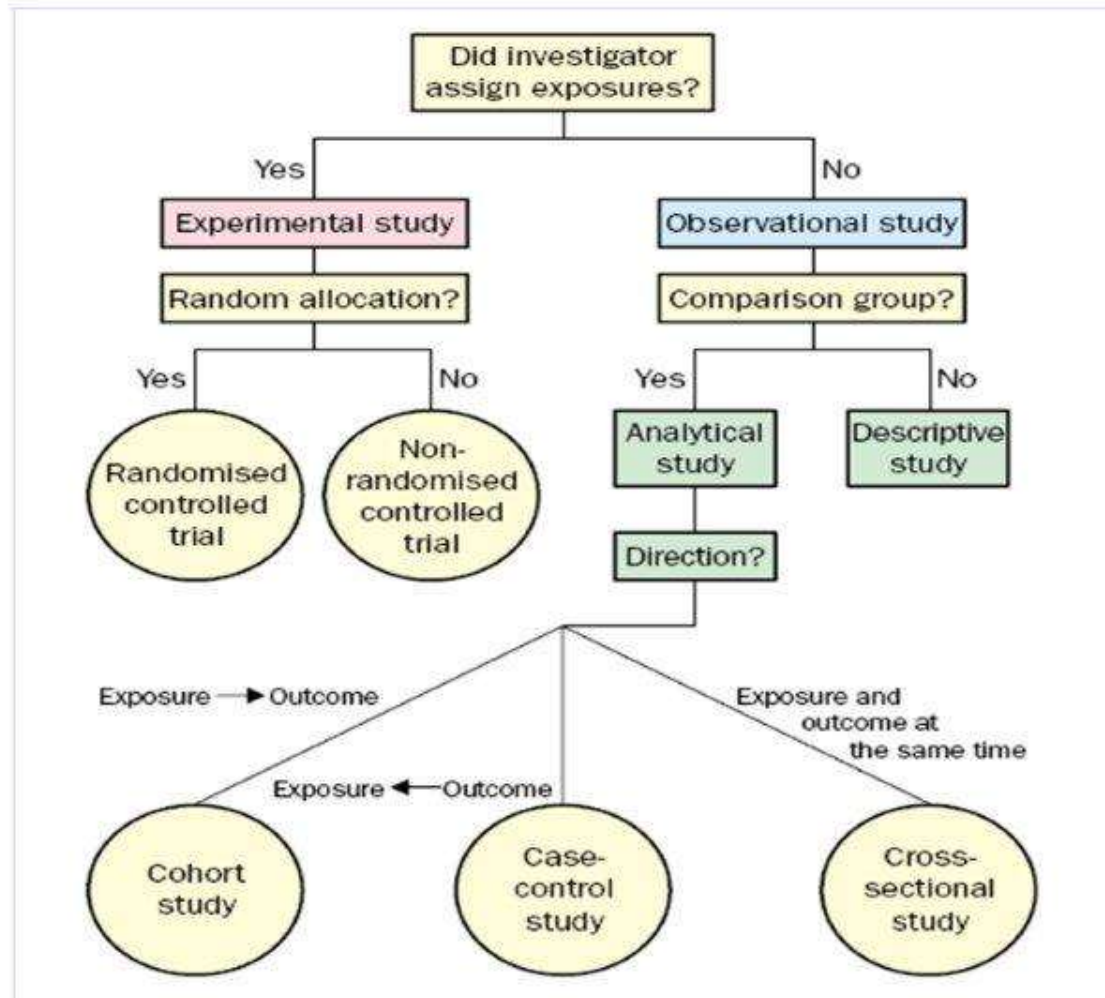
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- use the Siphon scenario described earlier to illustrate how a particular public health problem can give rise to a number of separate studies, each with their own purpose, aim or topic, relating to the overall problem described. :

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- To describe availability of running water, storm water drainage, and water storage practices in the informal settlement.
 - To determine access to and utilisation of primary, secondary and tertiary child health services among mothers of pre-school children in the informal settlement.
 - To determine childhood mortality rates in the informal settlement, by cause, age group and season.

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- To determine prevalence of malnutrition among children under five years in the community.
 - To describe knowledge, attitudes and practices of child caregivers concerning diarrhoea and its treatment.
 - To compare the childhood mortality in communities with and without piped water.

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- To determine the socioeconomic risk factors for diarrhoea.
 - To investigate maternal education as a risk factor for death among children who get diarrhoea.
 - To compare the diarrhoea mortality in a community before and after the introduction of piped water into that community.
 - To evaluate the effect of a community health worker programme focusing on appropriate treatment by mothers of children with diarrhoea.

Epidemiologic Study Designs



METHODOLOGY

- *Sample population*
- *Research Design*
- *Sampling*
- *Measurement instruments*
- *Data collection procedures*
- *Data analysis*

Questionnaires

- Properly defined goals will assure a good questionnaire design
- Questionnaire should not be too long
- Pilot the questionnaire
- Formulate a plan for statistical analysis
- Make the packaging attractive
- Provide a well-written cover letter
- Give a short and meaningful title to questionnaire

Cont.

- Include clear instructions for completing the questionnaire
- Set up a rapport with the first few questions...interesting and not too intrusive (but remember your goals!!)...important questions should be nearer the beginning
- Use simple language
- Provide ample space for responses

Types of Questions

- Dichotomous-two choices
- Multiple three or more choices
- Likert style-shows amount of agreement
- Semantic-direction & intensity of feelings
- Numeric-specifies value

Quantitative Research

- The aim is to determine the relationship between one thing (an independent variable) and another (a dependent or outcome variable) in a population.
- Quantitative research designs are either descriptive or experimental.

Quantitative research

- Descriptive research establishes only:
 - associations between variables
 - no attempt to bring a change.
- Experimental Research:
 - Establishes causality, and in most instances brings about intervention

Important Concepts

- Sampling
 - Population
 - Sample
- Validity and reliability
- Confounder/confounding
- Ethics