

Dissertation Module Research Skills Program

LECTURE 5

RESEARCH QUESTION AND RESEARCH DESIGN

LEARNING OBJECTIVES

- Be able to identify the most suitable research design for your research question.

**For every research question one can find *the* ideal study design;
unfortunately it may not always be feasible.**

Examples of Research Questions

- (1) What are the most frequent medical conditions of patients presenting to primary health care practitioners in India?**
- (2) What is the effectiveness of a community mobilization program to reduce HIV risk in rural South Africa?**
- (3) What are the main risk factors for COPD for people living in the highlands of Papua New Guinea?**
- (4) What are the main barriers to using cervical cancer screening for women living in Zimbabwe?**
- (5) What is the accuracy of a new malaria rapid diagnosis test used in Kinshasa, DRC?**
- (6) What is the effect of calcium supplementation on maternal mortality for women living in Addis Ababa, Ethiopia?**

Research Designs

Quantitative

Qualitative

Descriptive

Cross-sectional study

Case Reports

Ecological Study

Comparative

Analytic Research

Quality Control Research

Observer Variability

Laboratory Quality Control

Experiment

Clinical Trial

Preventive Study

Observational Study

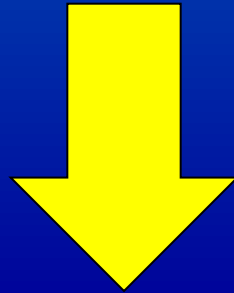
Cohort Study

Case-Control Study

Cross Sectional Study

Research Question to Research Design

(1) What are the most frequent medical conditions of patients presenting to primary health care practitioners in India?



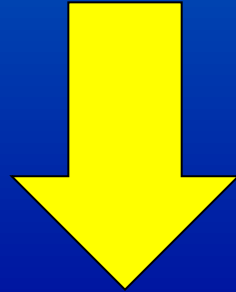
Quantitative (“most frequent”)
Descriptive (no comparisons stated)

Design options

Descriptive cross-sectional study of primary health care practitioners in India and their patients.

Research Question to Research Design

(2) What is the effectiveness of a community mobilization program to reduce the risk acquiring HIV in rural South Africa?



Quantitative (“effectiveness”)

Comparative

Experimental (intervention = “community mobilization program”)

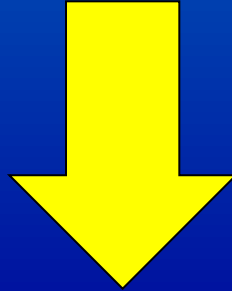
Design options

Experimental preventative study maybe a cluster randomised controlled trial comparing communities where program is implemented (intervention group) with communities where program is not implemented.

Before vs After study: comparing communities at baseline and after intervention was implemented for some time.

Research Question to Research Design

(3) What are the main risk factors for COPD for people living in the highlands of Papua New Guinea?



Quantitative

Comparative (people with risk factor vs people without risk factor)

Observational (unethical to experimentally increase risk factors)

Design options

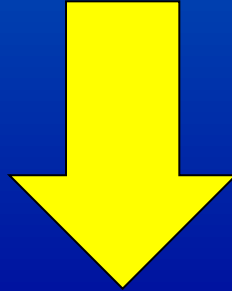
Cohort study: Follow-up of people who cook with open fire in-house (risk factor) and people who don't to detect new cases of COPD

Case-Control study: Asking patients with COPD and a control group with no COPD whether they cook with open fire, smoke etc.

Cross-sectional study: A sample of people from PNG are assessed for COPD and asked whether they cook with open fire, smoke, etc.

Research Question to Research Design

(4) What are the main barriers to using cervical cancer screening for women living in Zimbabwe?



Quantitative AND/OR Qualitative
Descriptive (no comparisons)

Design options

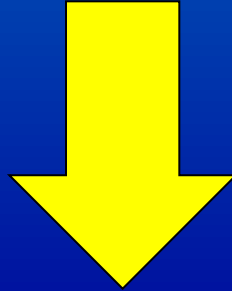
Qualitative study: In-depth interviews of women and health professionals

Descriptive cross-sectional study: Asking a sample of women about the main barriers in a standardised pre-set format

Mixed Method study: Combining the qualitative study and the cross-sectional study for best understanding.

Research Question to Research Design

(5) What is the accuracy of a new malaria rapid diagnosis test used in Kinshasa, DRC?



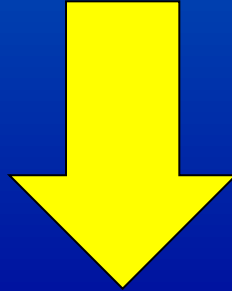
Quantitative
Comparative (rapid test compared to “gold” standard test)
Quality control research

Design options

Agreement study to calculate sensitivity and specificity of rapid test compared to microscopy by experts (“gold” standard) using a sample of people living in Kinshasa.

Research Question to Research Design

(6) What is the effect of calcium supplementation on maternal mortality for women living in Addis Ababa, Ethiopia?



Quantitative
Comparative (calcium supplementation yes versus no)
Experimental study

Design options

Randomised controlled trial of pregnant women who are randomised to either the intervention group (receiving 1 gr Ca per day) or the control group (receiving a placebo per day). Women are followed-up to detect a difference in maternal mortality.

SUMMARY

- Qualitative studies do not aim to generalize to a wider population. These studies are often used to answer a “why?”, “how?”, or “what?” question.
- Descriptive studies describe occurrences of disease or risk factors by person, place and time characteristics.
- Analytic studies can confirm or reject comparative research hypotheses.
- Experimental studies are comparative studies in which the researchers alter the study factor (e.g. therapeutic trials).
- Comparative observational studies are mostly etiologic studies; i.e. studies that aim to identify risk factors of disease. In these studies the study factor is only observed by the researchers.

“For every research question one can find *the* optimal study design.”