Theoretical Framework Conceptual Framework Research Problem Hypothesis

Detty S Nurdiati

Clinical Epidemiology & Biostatistics Unit
Department of Obstetric & Gynecology, Faculty of Medicine
Universitas Gadjah mada/RSUP Dr. Sardjito
Yogyakarta

Reviewing the literature

Reasons?

- Clarify and focus on research problem
- Improve methodology
- Broaden knowledge base in research area

Procedure?

- Search for existing literature
- Review the literature selected

Develop a theoretical framework

Develop a conceptual framework

Search for existing literature

Finding as much as possible and being strategic

- Be **sensitive**
  - broad but not too broad!
- **Minimise bias**
  - consult multiple databases and resources
- Be **efficient**
  - start where you expect highest yield

Find the highest level of evidence

- **Books?**
- **Journals?**
  - Hard copies
  - Citation or abstract indices
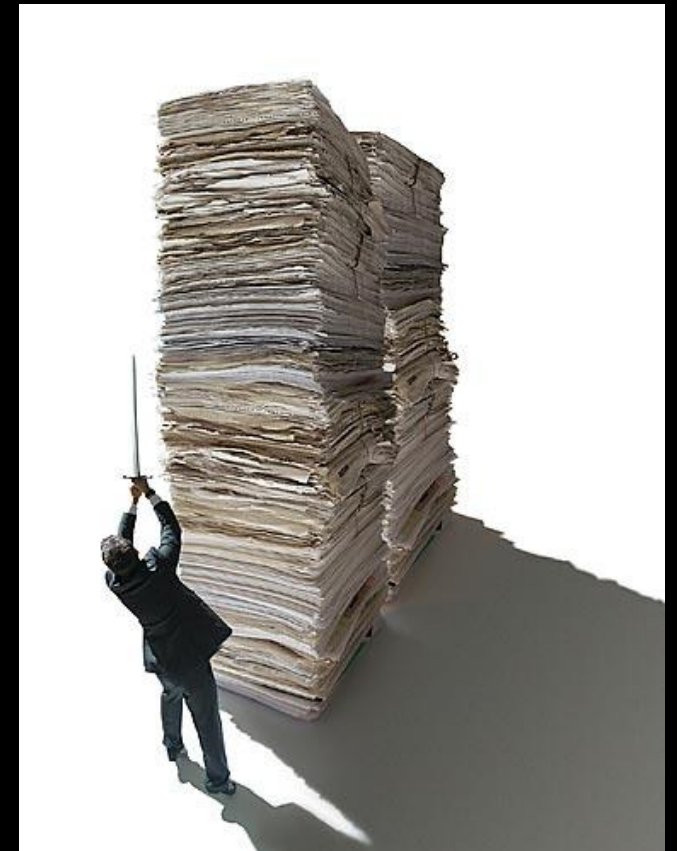 - Electronic database/Internet base

1. Prostate-Specific Antigen/
2. prostate specific antigen.mp.
3. psa.mp.
4. digitial rectal examination.mp.
5. dre.mp.
6. transrectal ultrasound$.mp.
7. TRUS.mp.
8. or/1-7
9. Mass Screening/
10. screening.mp
11. or/9-10
12. Prostatic Neoplasms/pc, di [Prevention & Control, Diagnosis]
13. prostat$ cancer.mp
14. or/12-13
15. clinical trial.pt.
16. random$.mp
17. ((single or double) adj (Blind$ or mask$)).mp
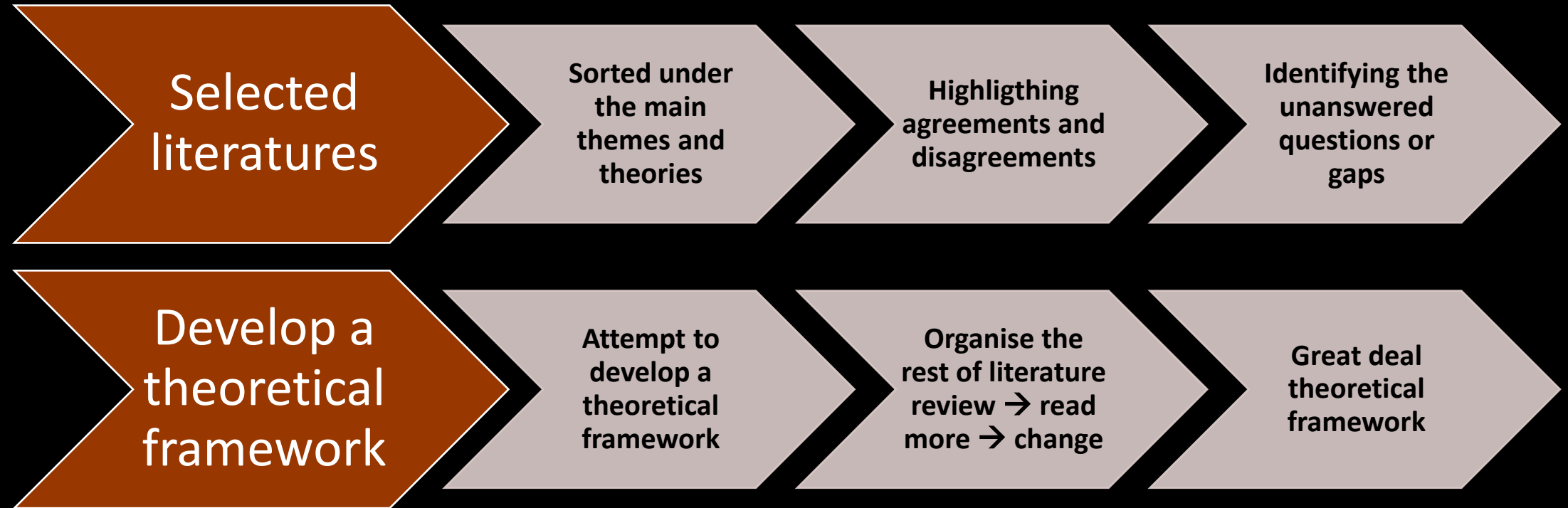18. placebo$.mp
19. or/14-18
20. 8 and 11 and 14 and 19

| Level of Evidence	Study Design
I	Systematic review of all relevant RCTs
II	At least one properly-designed RCT
III-1	Well-designed pseudo-randomised controlled trials
III-2	Comparative studies (not randomised) with concurrent controls and allocation, cohort, case-control, etc
III-3	Comparative studies with historical control
IV	Case series, either post-test or pretest/post-test.

Review the literature selected

- Note whether the **knowledge relevant to research problem** has been confirmed beyond doubt?

- Note the **theories put forward**, their basis, the methodology adopted?

- Examine to what extent the findings **can be generalised** to other situations?

- Notice where there are **significant differences** of opinion among researchers and give your opinion about the validity of these differences?

- Ascertain the areas in which **little or nothing is known**? The **gaps that exist** in the body of knowledge?

Develop a theoretical framework

Selected literatures → Sorted under the main themes and theories → Highligthing agreements and disagreements → Identifying the unanswered questions or gaps

Develop a theoretical framework → Attempt to develop a theoretical framework → Organise the rest of literature review → read more → change → Great deal theoretical framework

How do you develop the theoretical framework, if you want to study the relationship between mortality and fertility?
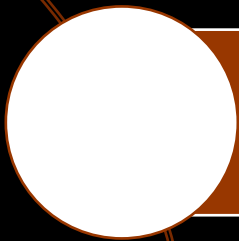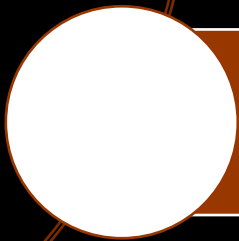
Fertility
Trends, theories, some of the indices and critiques of them, factor affecting fertility, methods of controlling fertility, factors affecting acceptance of contraceptives, etc.
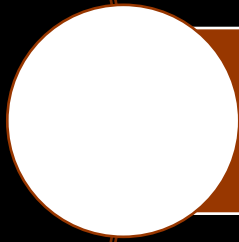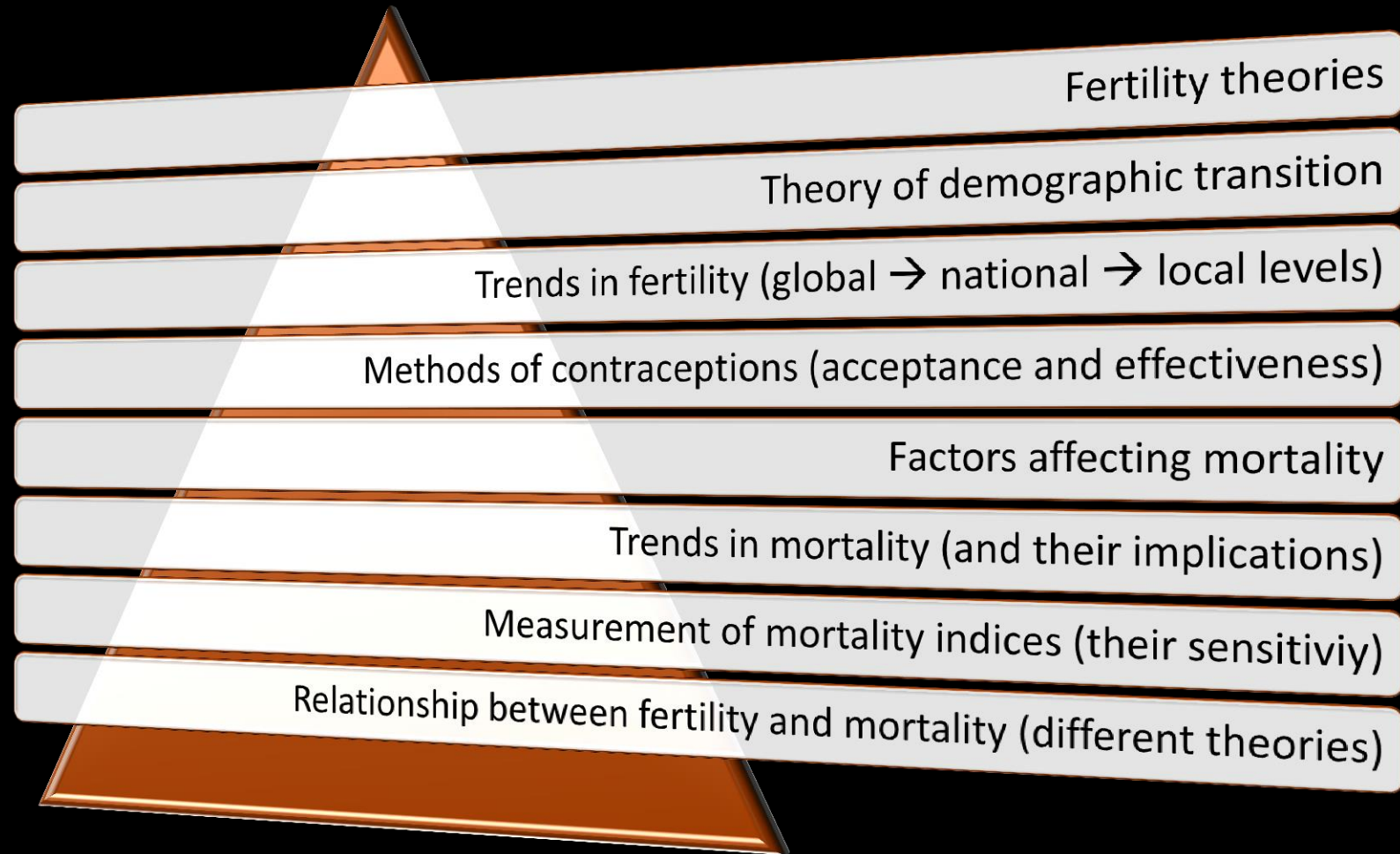
Mortality
Factors affecting mortality, mortality indices and their sensitivity in measuring change in mortality levels or a population, trends in mortality, etc.

The relationship between fertility and mortality
Theories that have been put forward to explain the relationship, and its implications.

The literature review should be written thoroughly, with most of the review involving examining the relationships between fertility and mortality

Fertility theories

Theory of demographic transition

Trends in fertility (global → national → local levels)

Methods of contraceptions (acceptance and effectiveness)

Factors affecting mortality

Trends in mortality (and their implications)

Measurement of mortality indices (their sensitiviy)

Relationship between fertility and mortality (different theories)

Develop a Conceptual Framework

Theoretical Framework

Conceptual Framework
- Concentrates on one focus

All theories that have been put forward to explain the relationship between fertlity and mortality

Plan to test only one theory, related to the specific research problem
Exp: The fear of non-survival

Research Problem

- Potential research questions may occur to us on a regular basis, but the process of formulating them in a meaningful way is not at all an easy task (Powers, et al., 1985)

- First identifying and then specifying a research problem might seem like research tasks that ought to be easy and quickly accomplished. However, such is often not the case (Yegidis & Weinback, 1991)
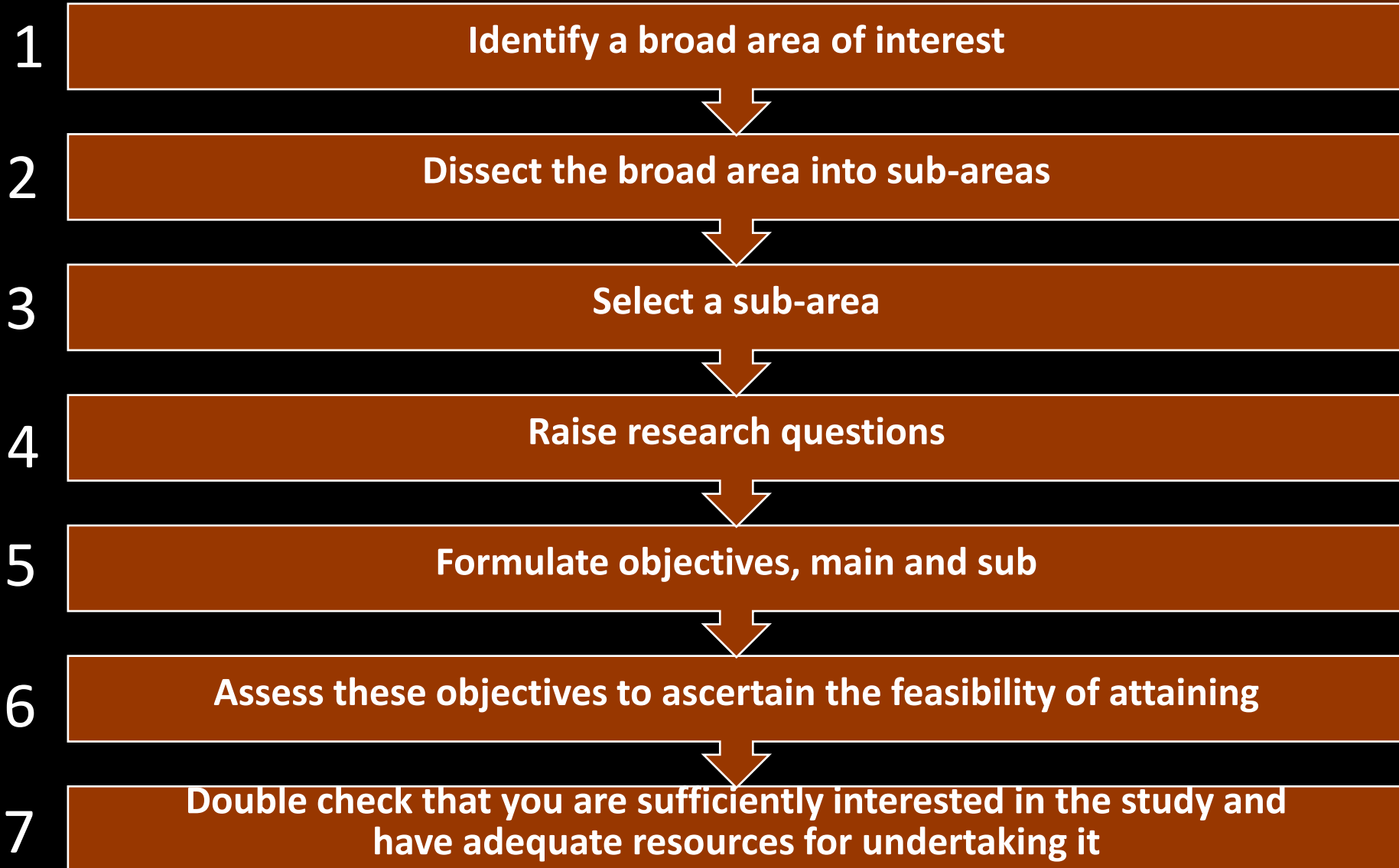
Source of a Research Problem

Aspects of a study	About	Study of
Study Population	People	Individuals, organisations, groups, communities
Subject Area	Problem	Issues, situations, associations, needs, population composition, profiles, etc
	Program	Contents, structures, outcomes, attributes, satisfaction, consumers, service providers, etc
	Phenomenon	Cause and effect relationships, the study of a phenomenon itself, etc.

Considerations in Selecting Research Problems
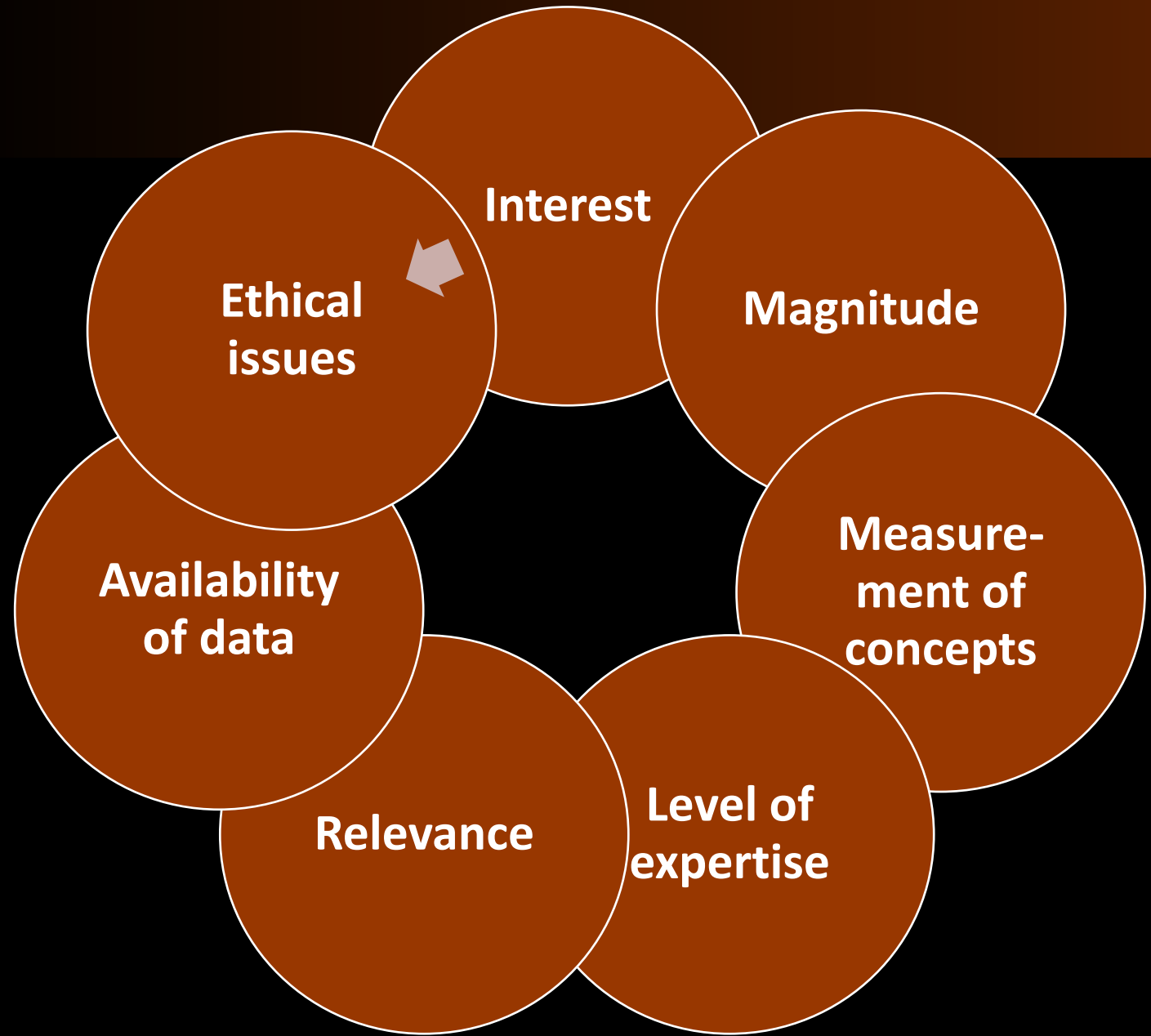
Steps in the Formulation of a Research Problem

1 | Identify a broad area of interest

2 | Dissect the broad area into sub-areas

3 | Select a sub-area

4 | Raise research questions
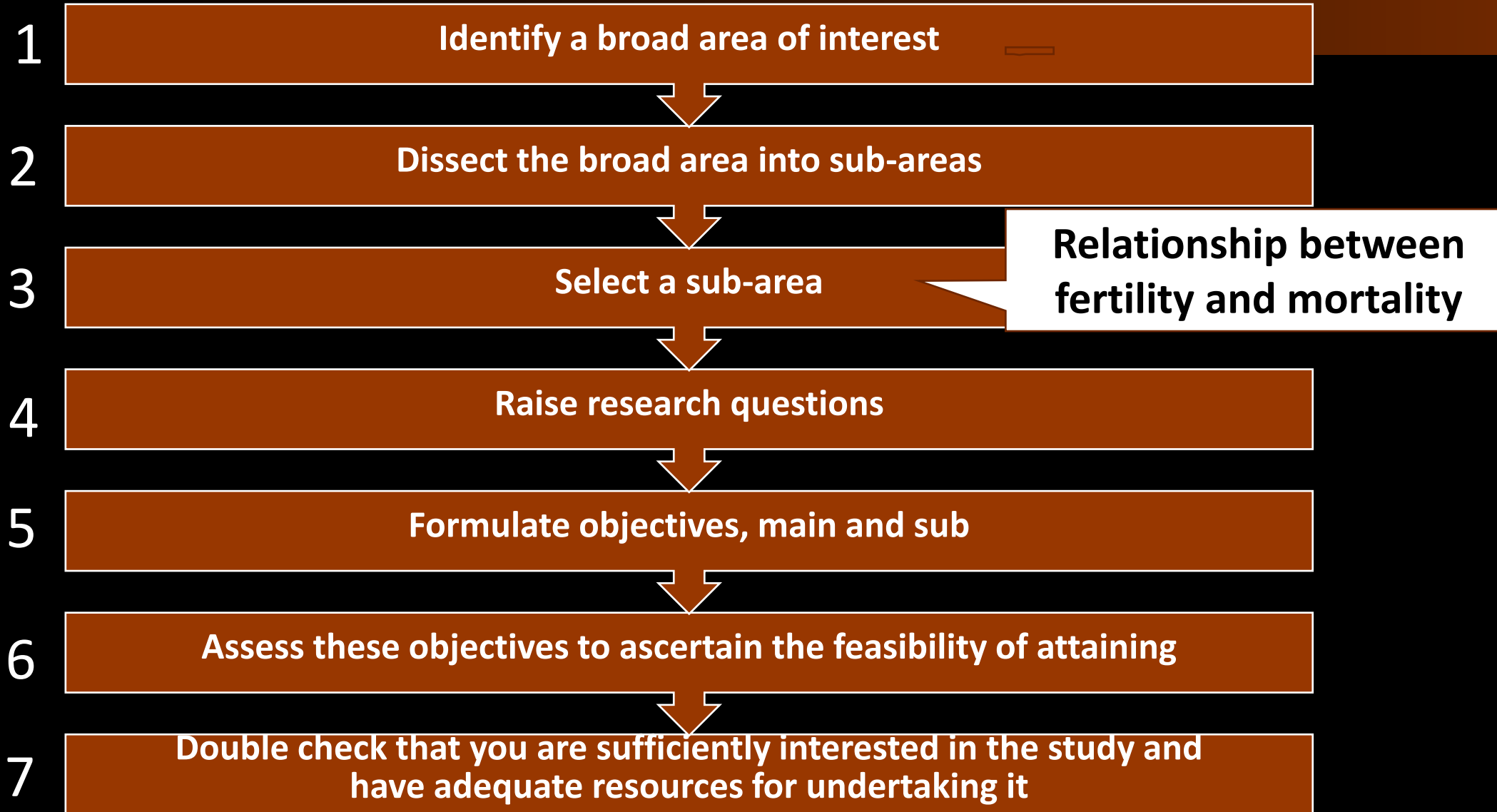
5 | Formulate objectives, main and sub

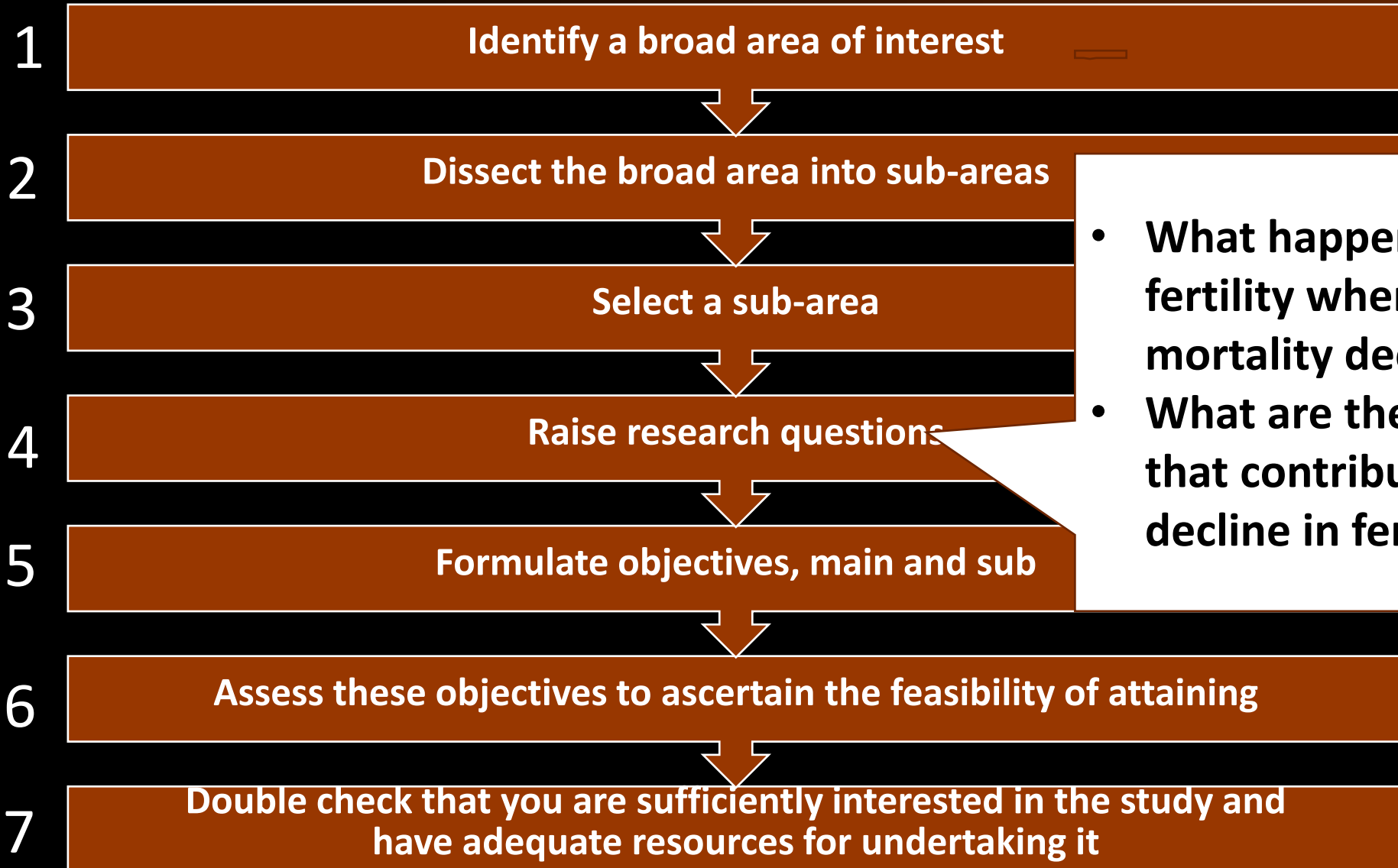6 | Assess these objectives to ascertain the feasibility of attaining

7 | Double check that you are sufficiently interested in the study and have adequate resources for undertaking it

Steps in the Formulation of a Research Problem

1 — Identify a broad area of interest **Fertility and Mortality**

2 — Dissect the broad area into sub-areas

3 — Select a sub-area

4 — Raise research questions

5 — Formulate objectives, main and sub

6 — Assess these objectives to ascertain the feasibility of attaining

7 — Double check that you are sufficiently interested in the study and have adequate resources for undertaking it

Steps in the Formulation of a Research Problem

1 | Identify a broad area of interest

2 | Dissect the broad area into sub-a[reas]

3 | Select a sub-area

4 | Raise research questions

5 | Formulate objectives, main and sub

6 | Assess these objectives to ascertain the feasibility of attaining

7 | Double check that you are sufficiently interested in the study and have adequate resources for undertaking it

- **Trends in fertility and mortality in a country**
- **Determinant of fertility behavior**
- **Relationship between fertility and mortality**
- **Impact of health services on mortality**

Steps in the Formulation of a Research Problem

1 Identify a broad area of interest

2 Dissect the broad area into sub-areas

3 Select a sub-area

Relationship between fertility and mortality

4 Raise research questions

5 Formulate objectives, main and sub

6 Assess these objectives to ascertain the feasibility of attaining

7 Double check that you are sufficiently interested in the study and have adequate resources for undertaking it

Steps in the Formulation of a Research Problem

1 Identify a broad area of interest

2 Dissect the broad area into sub-areas

3 Select a sub-area

4 Raise research questions

5 Formulate objectives, main and sub

6 Assess these objectives to ascertain the feasibility of attaining

7 Double check that you are sufficiently interested in the study and have adequate resources for undertaking it

- **What happens to fertility when mortality declines?**
- **What are the factors that contribute to the decline in fertility?**

Steps in the Formulation of a Research Problem

1 Identify a broad area of interest

2 Dissect the broad area into sub-areas

3 Select a sub-area

4 Raise research questions

5 Formulate objectives, main and sub

6 Assess these objectives to ascertain the feasibility of attaining

7 Double check that you are sufficiently interested in the study and have adequate resources for undertaking it
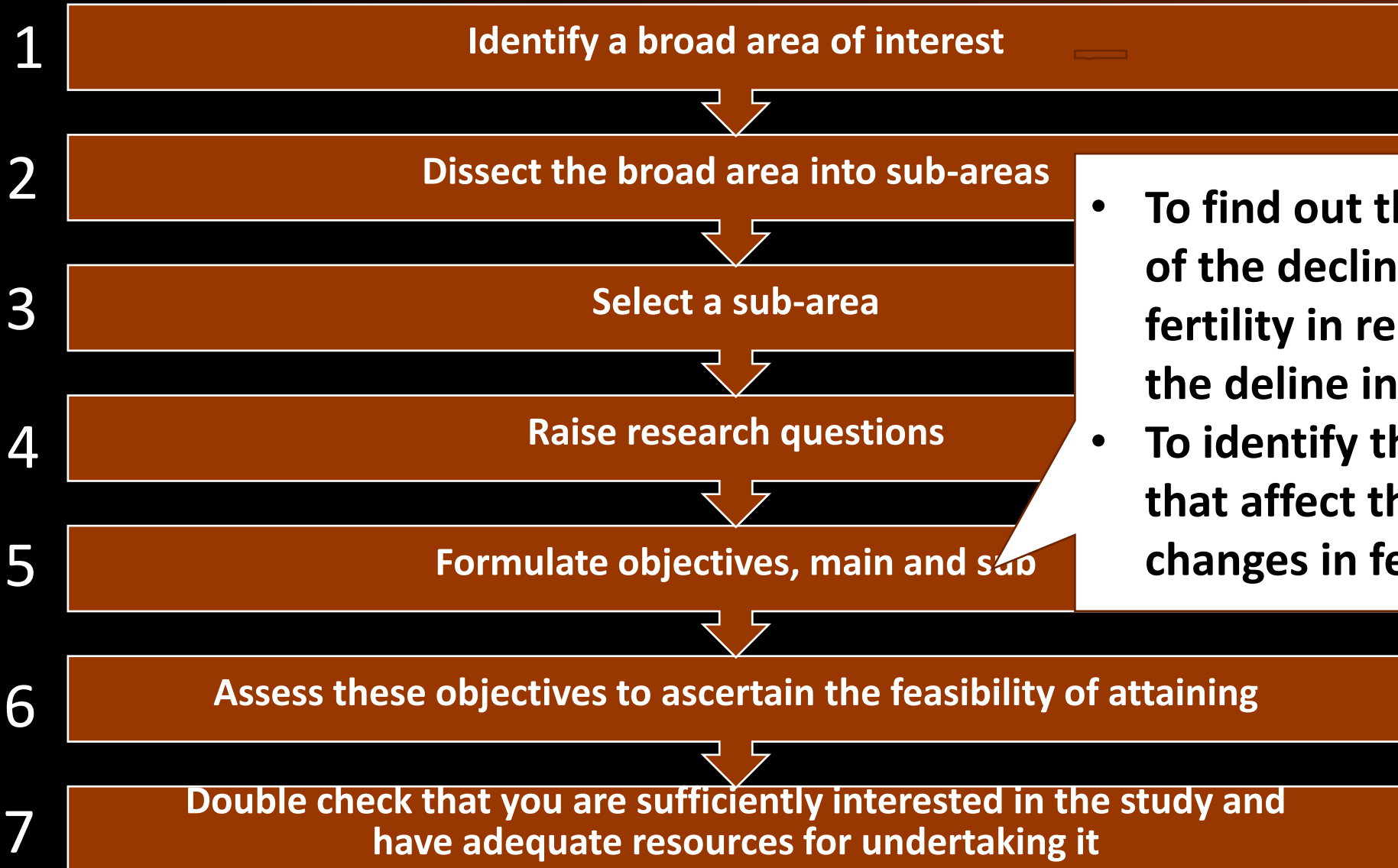
- To find out the extent of the decline in fertility in relation to the deline in mortality
- To identify the factors that affect the changes in fertility?

Steps in the Formulation of a Research Problem

1 Identify a broad area of interest

2 Dissect the broad area into sub-areas

3 Select a sub-area

4 Raise research questions

5 Formulate objectives, main and sub

6 Assess these objectives to ascertain the feasibility

7 Double check that you are sufficiently interested in the study and have adequate resources for undertaking it
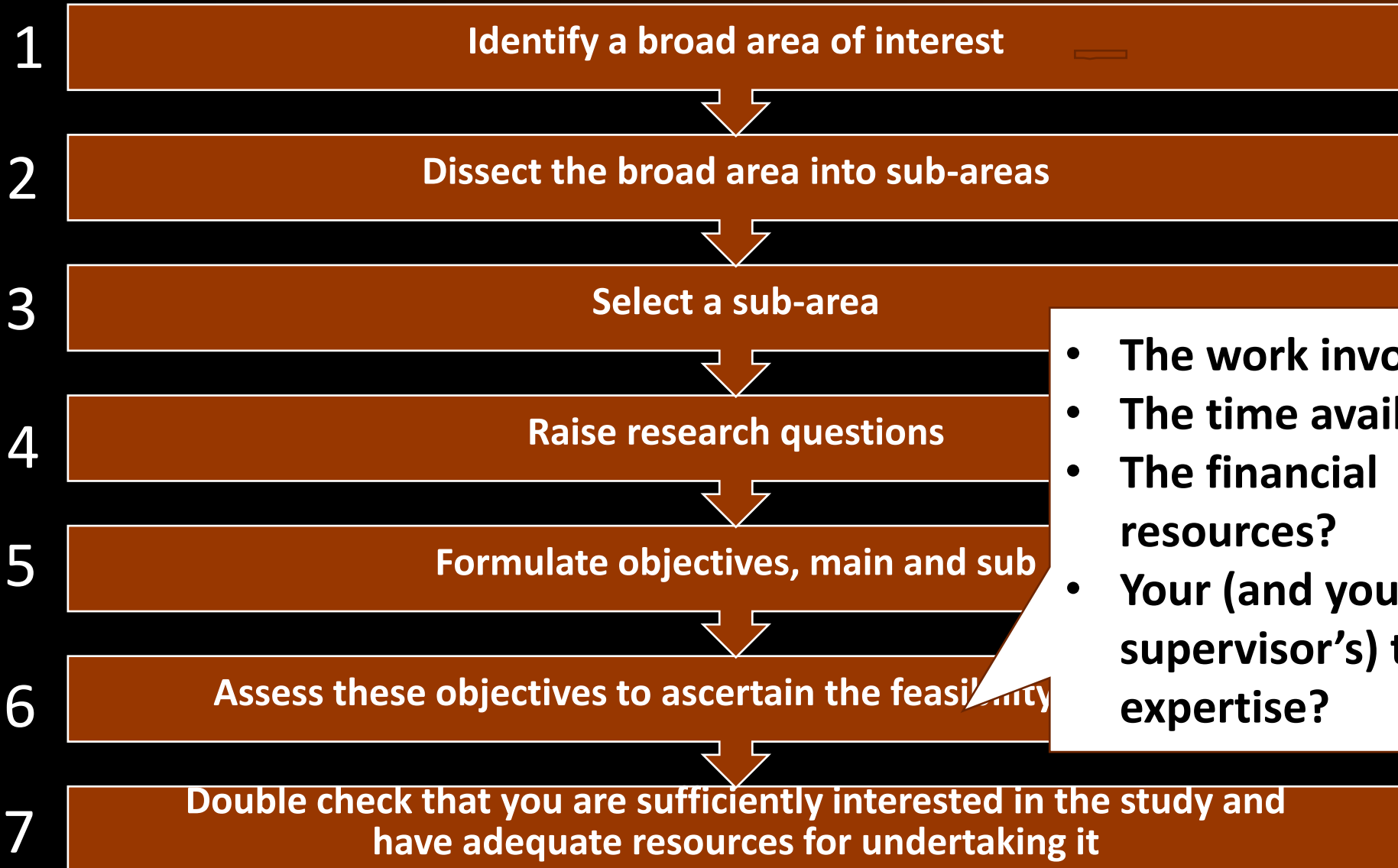
- The work involved?
- The time availability?
- The financial resources?
- Your (and your supervisor's) technical expertise?

Steps in the Formulation of a Research Problem

1 **Identify a broad area of interest**

2 **Dissect the broad area into sub-areas**

3 **Select a sub-area**

4 **Raise research questions**

5 **Formulate objectives, main and sub**

6 **Assess these objectives to ascertain the feasibili**

7 **Double check that you are sufficiently interested in have adequate resources for undertaking it**
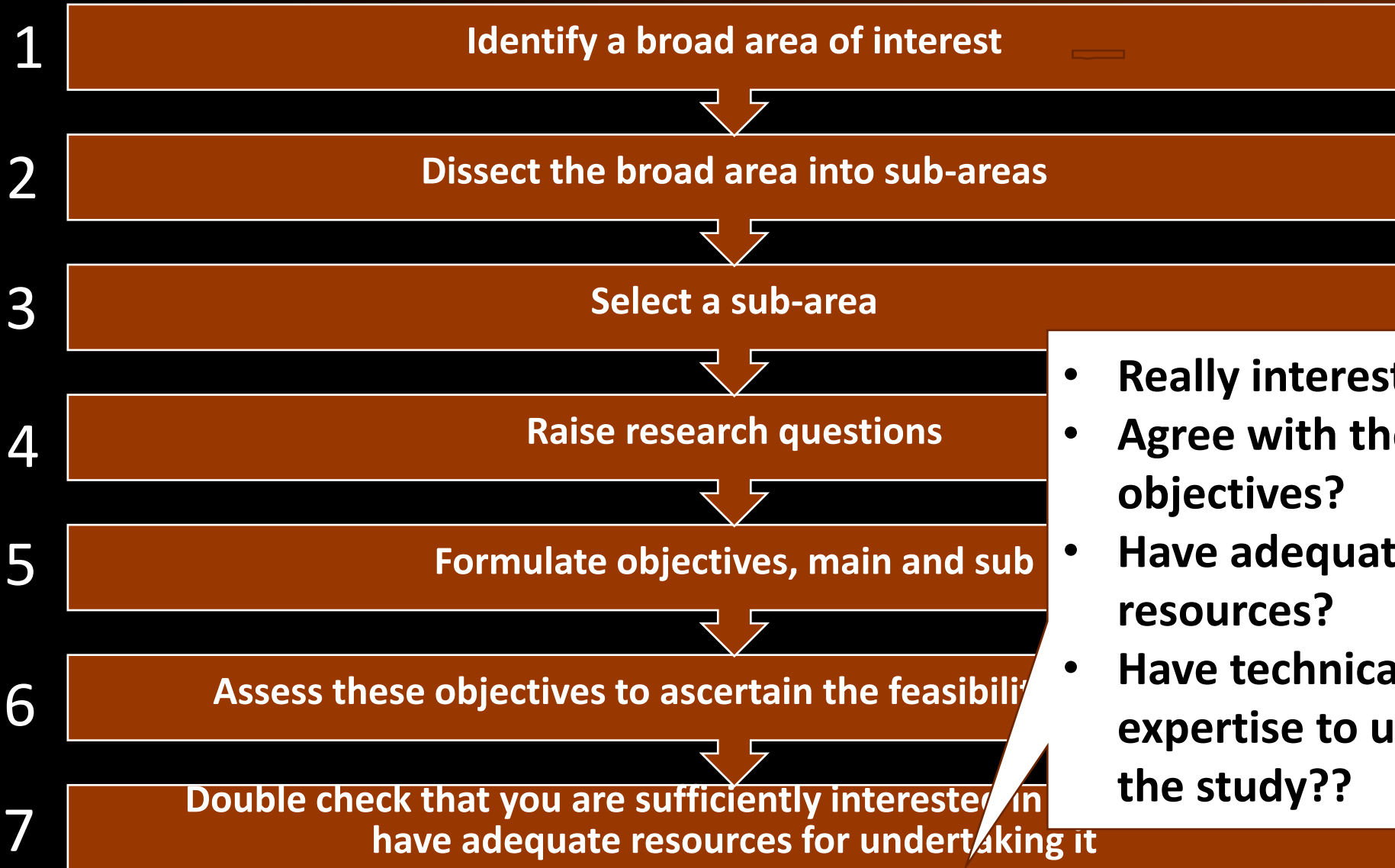
- **Really interested?**
- **Agree with the objectives?**
- **Have adequate resources?**
- **Have technical expertise to undertake the study??**

Hypothesis

- A propotion, condition, or principle which assumed, perhaps without belief, in order to draw out its logical consequences and by this method to test its accord with facts which are known or may be determined (Webster's Dictionary).

- A hypothesis is written in such a way that it can be proven or disproven by valid and reliable data – it is in order to obtain these data that we reform our study (Grinnel, 1988).

- Bring clarity, specificity and focus a research problem, but are not essential for a study.

- The importance of hypotheses lies in their ability to bring direction, specificity and focus to a research study.

Hypothesis Function

- Provides a study with focus → tell what specific aspects of a research problem to investigate.

- Tell what data to collect and what not to collect → focus to the study.

- Enhance objectivity in a study.

- Enable researcher to add the formulation of theory and help bridging the gaps in the body of knowledge.

Hypotheses Characteristics

Simple specific and conceptually clear

Capable of verification

Related to the body of knowledge

Operationalisable

Exercise 1

- **To test the effect different combinations of maternal and child health (MCH) services and nutrition sypplements (NS) have in the infant mortality rate**

		Maternal and Child Health Services (MCH)	
		Yes	No
Nutrition Supplements (NS)	Yes	MCH + NS	NS
	No	MCH	Control

Exercise 2

- To study the smoking pattern in a community in relation to gender differentials.

Error in Testing a Hypothesis

The study design selected in faulty

The sampling procedure adopted is faulty

The method of data collection in inaccurate

The analysis is wrong

The statistical procedures applied are inappropriate

The conclusions drawn are incorrect

Literatures

- Altman DG. 1990. Practical statistics for medical research. Chapman & Hall, London.

- Bland M. 2000. An introduction to medical statistics, 3rd edn. Oxford University Press, Oxford.

- David AG , Kenneth FS. 2002. An overview of clinical research: the lay of the land. The Lancet.2002;359(9300):57-61. DOI: 10.1016/S0140-6736(02)07283-5.

- Greenhalgh T. 2012. How to read a paper: a basics of evidence-based medicine, 4rd edn. Willey-Blackwell, Chichester.

- Kirkwood B, Sterne J. 2003. Essential medical statistics, 2 nd edn. Wiley-Blackwell, Chichester.

- Kumar R. 1999. Research Methodology: A step-by-step guide for beginners. London: Sage Publications Ltd.

Have a productive and good workshop... ☺