Lecture 9

Introduction to mixed methods research

Objectives

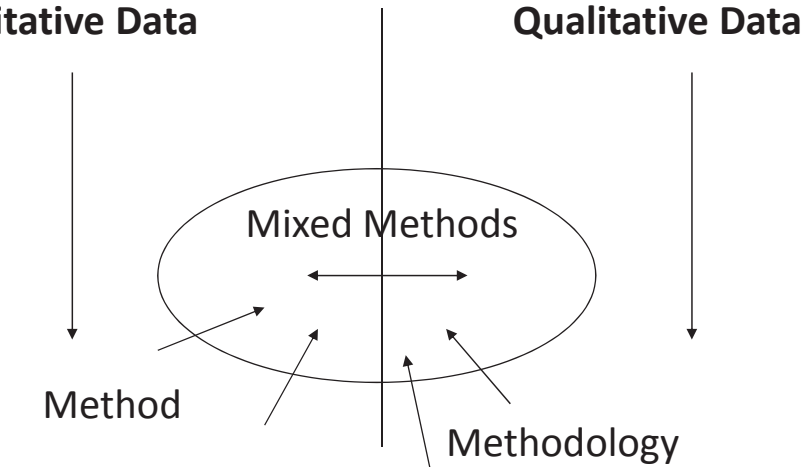
- Distinguish between quantitative, qualitative and mixed research designs
- Identify when qualitative and qualitative approaches can complement each other
- Select from a range of mixed methods designs
- Explain when mixed methods designs may not be appropriate

Definition

Mixed methods consists of:

the collection or analysis of both quantitative and qualitative data in a single study in which the data are collected concurrently or sequentially, are given a priority, and involve the integration of data at one or more stages in the process of research.

(Creswell et al., 2003: 212)



Quantitative research

- Make decisions before study (variables, hypotheses, instruments)
- Reduce the inquiry to a small number of variables to study and a large number of people
- Ask specific closed-ended questions
- Analyses numbers
- Importance on reliability, validity, generalizability, replicability, control, and lack of bias
- Writes the report using a standard structure

Qualitative research

- Make decisions based on views of participants
- Open the inquiry up to understand the complexity of the situation
- Ask open-ended questions – single phenomenon
- Analyse words and images
- Place emphasis on individual meaning, context, and self-reflexivity
- Write the report using a flexible, literary structure

How do we understand the social world and social life?

Quantitative methods

- Trends, graphs, statistics
- Cause-and-effect (factors that influence)
- Comparison of groups
- Frames study using theory

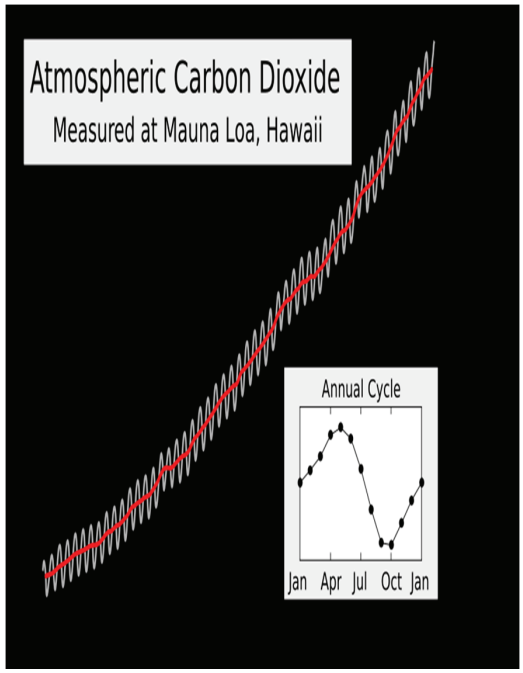
Qualitative methods

- Individual stories
- Different perspectives
- Complexity of situation
- Builds up to a theory

Stories and Trends

Whitechuck Glacier - 1973

Whitechuck Glacier - 2006



Characteristics of mixed methods research

- Collection of both qualitative and quantitative data (open- and closed-ended) in response to research questions
- The analysis of both qualitative and quantitative data
- Persuasive and rigorous procedures for the qualitative and quantitative methods
- The integration of these two data sources (merging, connecting, embedding)
- The use of a specific mixed methods design that involves a concurrent or sequential integration (and equal or unequal emphases)
- Approach to research that has a philosophical foundation

Epistemological positions

- Quantitative research emanates from an objectivist position which holds that reality exists independently of the researcher – the truth is 'out there'.
- Qualitative research is more closely linked to a constructivist paradigm, which sees truth and meaning as constructed and interpreted by individuals.

Relationship between researcher and subjects

- Quantitative research: Researchers aim to keep themselves at a distance (emotional/physical) from those they are researching.
- Qualitative research: Usually involves direct contact between researcher and those they are researching, sometimes for long periods of time.

Research focus

- Quantitative research concentrates on the gathering of ‘facts’, in order that ‘truth claims’ can be established.
- Qualitative researchers contend that truth and meaning do not exist in some external world, but are constructed through peoples’ interactions with the world.

Scope of findings

- Quantitative methods are regarded as nomothetic, which attempts to establish law-like findings that hold irrespective of time.
- Qualitative research is ideographic, which locates its findings in specific time periods and localities and is much more concerned with the depth and intensity of findings rather than breadth (generalizability).

The nature of data

- Quantitative studies generate data in the form of numbers, often depicted positively as reliable and rigorous
- Qualitative research generates what is claimed to be ‘rich’ or ‘deep’ data, usually in the form of text but sometimes in photographs, maps or other visual media.

Mixed methods allow researchers to…

- Generalize from a sample to a population (as in quantitative research).
- Gain a richer, contextual understanding of the phenomenon being researched (as in qualitative research).

Benefits of mixed methods designs

- **Triangulation:** Seeks convergence, corroboration and correspondence of results from different methods.
- **Complementarity:** Seeks elaboration, enhancement, illustration, clarification of results of one method with the results from the other method.
- **Development:** Seeks to use the results of one method to help or inform the other method.
- **Initiation:** Seeks the discovery of paradox and contradiction, new perspectives, the recasting of questions or the results from one method with questions or results from the other method
- **Expansion:** Seeks to extend the breadth and range of inquiry by using different methods from different inquiry components.

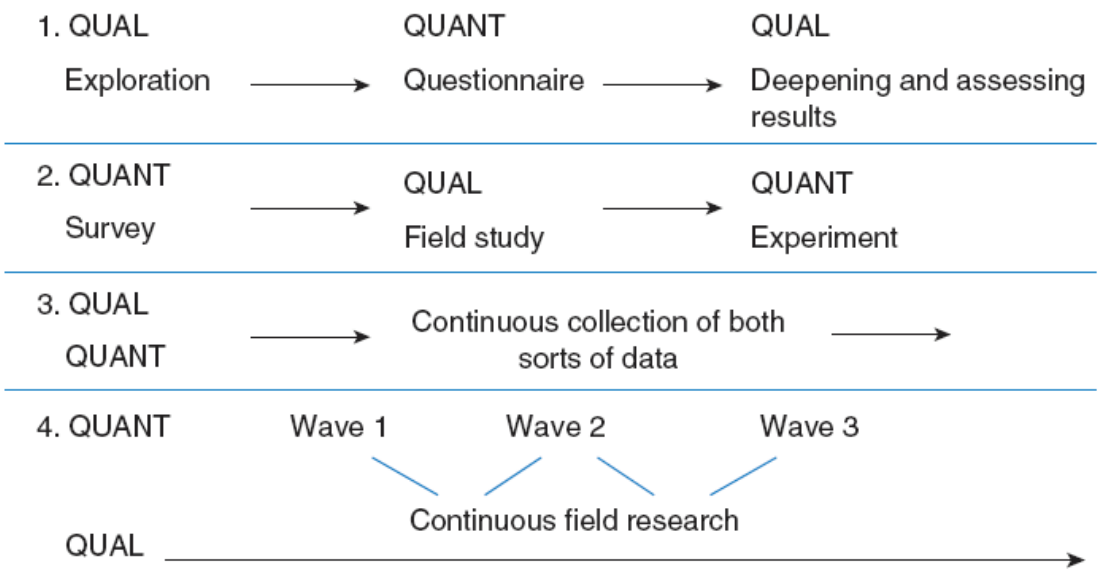
How methods can be mixed

Types of mixing	Comments
Two types of research question	One fitting a quantitative approach and the other qualitative.
The manner in which the research questions are developed	Pre-planned (quantitative) versus participatory/emergent (qualitative).
Two types of sampling procedure	Probability versus purposive.
Two types of data collection procedures	Surveys (quantitative) versus focus groups (qualitative).
Two types of data analysis	Numerical versus textual (or visual).
Two types of data analysis	Statistical versus thematic.
Two types of conclusions	Objective versus subjective interpretations.

Methodological developments

- Types of designs; diagrams, detailed procedures, notation
- Scripts for purpose statements
- Mixed methods research questions
- Analysis strategies for merging data
- Point of interface strategies for sequential data

Mixed methods models

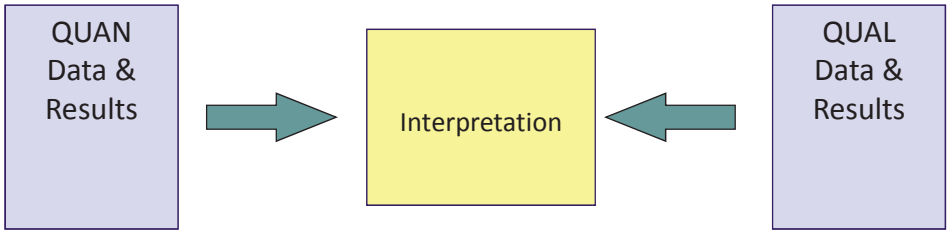


Typical Scenarios

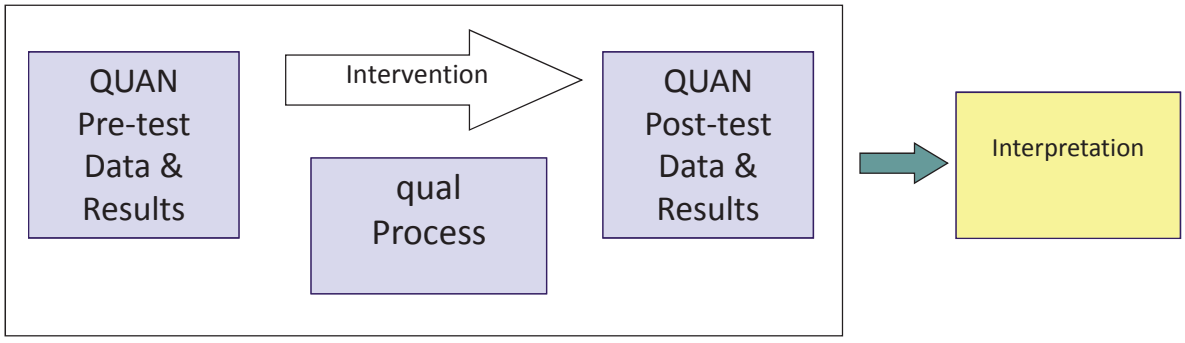
- Surveys and focus groups data are merged and compared.
- Survey is first completed and then focus groups used as a follow-up to explain the quantitative results.
- Focus groups are first conducted. Information learned is then used to construct an instrument for a follow-up with a random sample.
- An trial is conducted and qualitative data are collected before the experiment begins and after the trial has concluded.
- A longitudinal study is underway with multiple studies organized to address a single overarching research objective. The studies are both quantitative and qualitative .

Concurrent Mixed Methods Designs

Convergent Parallel Design

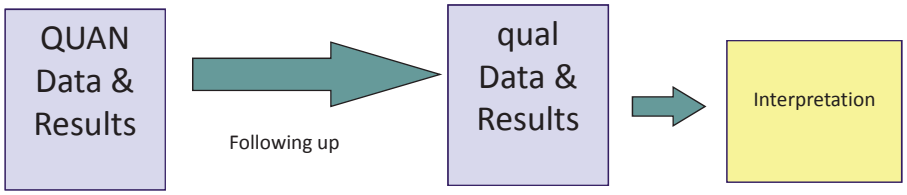


Embedded Design

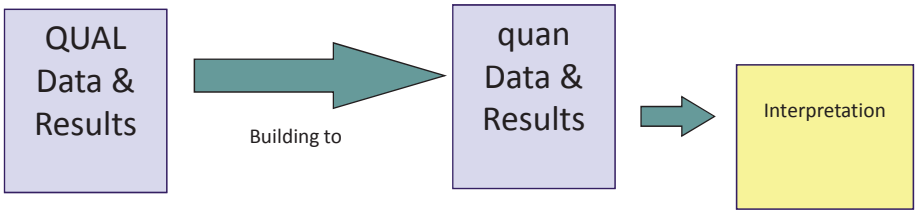


Sequential Mixed Methods Designs

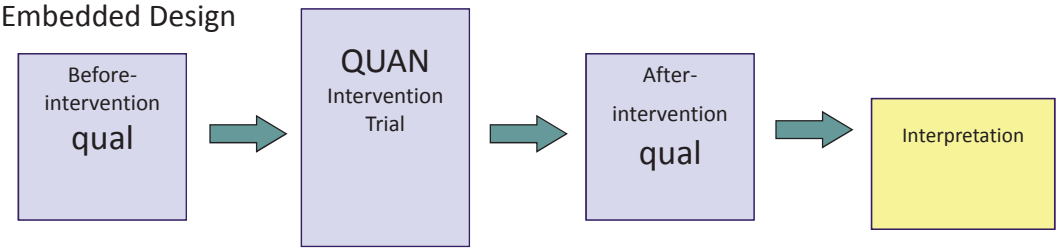
Explanatory Design



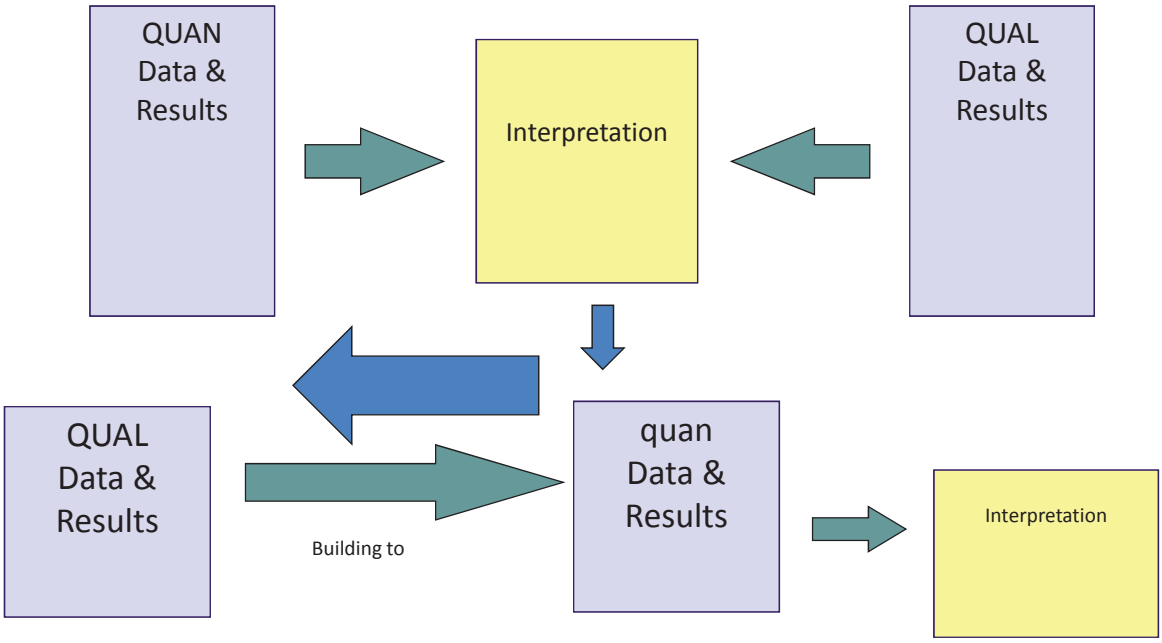
Exploratory Design



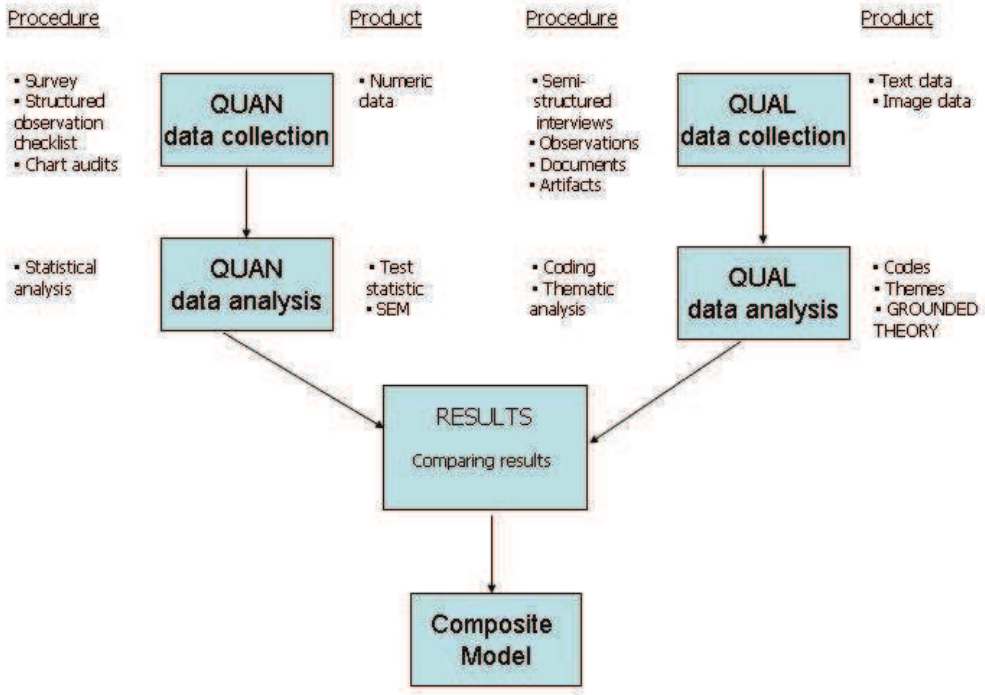
Sequential Embedded Design



Multiphase (or Multi-project) Design



Detailed design



A mixed methods research question

Three ways to write this question:

1. **Methodologically-focused**:
   - To what extent do the qualitative results confirm the quantitative results?
2. **Content-focused:**
   - How do the interviews support the quantitative results that their [quality of life] changes following an intervention?
3. **Hybrid of quantitative and qualitative elements:**
   - What results emerge from comparing the exploratory qualitative data with outcome quantitative instrument data?

Example (1)

BMC Health Services Research

BioMed Central

Research article

Open Access

Barriers to accessing TB diagnosis for rural-to-urban migrants with chronic cough in Chongqing, China: A mixed methods study

Qian Long[†1], Ying Li[†2], Yang Wang[*1], Yong Yue[†3], Cheng Tang[†4], Shenglan Tang[†5], S Bertel Squire[†5] and Rachel Tolhurst[†5]

Aims

- *The study reported in this paper aims to understand the health seeking behaviour of migrants for symptoms suggestive of TB, and to identify the factors influencing delays in receiving a TB diagnosis for this group in urban China.*

Methods

Quantitative:

- *A prospective cohort study of adult TB 'suspects' (over 15 years old) experiencing chronic cough for more than three weeks … was carried out over a period of 3 months in 23 randomly selected general health facilities ...*
- *Questionnaires were used to collect information on the health care seeking experiences.*

Methods

Qualitative

- *Focus Group Discussions (FGD) were held with 12 groups of women and men in the general rural-to-urban migrant population. Semi-structured individual interviews were conducted with: 20 TB 'suspects' recruited by the above survey; 17 newly registered TB patients who were identified to have experienced delays in receiving a TB diagnosis; and 23 key informants related to TB control*

Framework

Table 1: Framework of problem analysis for TB case finding

Step 1	Awareness --	The patient is aware that he/she is suffering from symptoms or complaints, which could be TB
Step 2	Motivation --	The patient suffering from symptoms which could be TB contacts a health care delivery point
Step 3	Selection --	The health professional suspects TB and requests a X-ray and sputum examination (smear)
Step 4	Examination --	The sputum test is correctly carried out on the patients thus selected

Results

Knowledge and awareness of TB and the TB control programme

Table 2: TB knowledge of the migrants and residents in the first round survey

		Migrants %(N)	Residents %(N)	P values
1. Have you heard of TB?	Yes	74.2 (170)	87.1 (676)	P > 0.05
	No	25.8 (59)	12.9 (100)	
2. Does TB have the symptom of chronic cough?	Yes	32.3 (74)	45.1 (350)	P < 0.01
	No	67.7 (155)	54.9 (426)	
3. Does TB have the symptom of hemoptysis?	Yes	36.7 (84)	64.4 (500)	P < 0.01
	No	63.3 (145)	29.1 (226)	
4. Is TB communicable?	Yes	62.9 (144)	82.5 (640)	P < 0.01
	No	37.1 (85)	17.5 (136)	
5. Can TB be treated free?	Yes	38.0 (87)	53.2 (413)	P < 0.01
	No	62.0 (142)	46.8 (363)	
6. Have you heard of TB dispensary?	Yes	61.2 (93)	58.6 (309)	P > 0.05
	No	38.8 (59)	41.4 (218)	

Results

Knowledge and awareness of TB and the TB control programme

- *The qualitative study findings support the above results and further explored respondents' perceptions of the free TB diagnosis and treatment policy.*

> *"I do not believe that [there is free treatment]. Even if there are relevant policies developed by the government, perhaps those people at the grass roots will not implement them." (Female casual worker from the FGD).*

Example (2)

Silal *et al. BMC Health Services Research* 2012, **12**:120
http://www.biomedcentral.com/1472-6963/12/120

BMC Health Services Research

RESEARCH ARTICLE Open Access

Exploring inequalities in access to and use of maternal health services in South Africa

Sheetal P Silal[1*], Loveday Penn-Kekana[2], Bronwyn Harris[2], Stephen Birch[3,4,5] and Diane McIntyre[3]

Background

- *South Africa's maternal mortality rate (625 deaths/ 100,000 live births) is high for a middle-income country, although over 90% of pregnant women utilize maternal health services.*
- *While health system barriers to obstetric care have been well documented, "patient-oriented" barriers have been neglected.*
- *This article explores affordability, availability and acceptability barriers to obstetric care in South Africa from the perspectives of women who had recently used, or attempted to use, these services.*

Methods

- Sequentially combining 1,231 quantitative exit interviews (QUAN) with 16 qualitative in-depth interviews (qual) with women who had recently used obstetric services
- The qualitative phase (Phase 2) was conceptualised at the same time as the quantitative phase (Phase 1), but could be used to triangulate and explore some of the themes emerging from the quantitative data

Mixing methods

- Data from both sets of interviews were integrated in the analysis, which sought “elaboration, enhancement, illustration and clarification of the results from one method with results from the other method”; a complementarity approach

Quantitative

- An exit interview questionnaire was developed to collect information on the use of, and access to, maternal health services as well as socioeconomic and demographic information.
- Utilisation details included type of delivery and number of nights spent at the facility
- Access information related to the availability, affordability and acceptability of services e.g. travel time to facility, costs incurred and health workers’ attitudes to patients.

Qualitative

- In-depth interviews were carried out with women chosen through a purposeful selection methodology to reflect a range of different delivery experiences, and with a particular focus on women who had obviously faced problems accessing services.

Results (quantitative)

Availability

- Those who completed high school and those who had a tertiary qualification travelled 17 ($p=0.02$) and 23 ($p=0.01$) minutes less respectively on average than those without, or with only primary education to get to their facility.
- Patients who were travelling to primary health care clinics took on average 23 minutes less than those travelling to district hospitals ($p<0.001$).

Results (quantitative)

Accessibility

- A greater proportion of participants in the rural sites felt that the health worker was too busy to attend to them compared to those in the urban sites ($p<0.001$).
- Respect from the health worker and having your privacy respected was also significantly higher in urban sites than rural sites ($p<0.001$ and $p=0.002$ respectively).

Results (qualitative)

- One woman “gave up” on delivering within a facility after she had been to a clinic but was told she was only in early labour and to come back later. She pleaded with the nurses that she lived far from the clinic and that it would be hard for her to come back but she was told the clinic was full. She then went home and delivered with the help of a neighbour who was experienced in giving massage to assist women with deliveries.

Results (qualitative)

- Four of the women delivered at home waiting for transport (mainly ambulances), and two delivered on the way to the facility.
- One woman, who was having her fifth child, lived in an informal settlement and the ambulance service said it would come to the nearest clinic, which was still some distance from her house. She did not have funds to organise other forms of transport. The ambulance took four hours to get to the clinic by which time she had given birth.

Results (combined)

- The acceptability dimension represents a barrier to service access.
- The quantitative results highlight how a greater proportion of patients in rural sites felt that the health worker was too busy.
- The qualitative results highlight how one bad experience of health services (e.g. being turned away from ANC services due to coming on the “wrong day”) can translate into not wanting to return to a health facility for delivery.

Conclusion

- If South Africa wants to ensure that all women use antenatal and obstetric services, more needs to be done to respond to “patient-oriented” barriers; the factors that impede the opportunity or freedom of women to use these needed services.
- This requires improving the “fit” between the health care system and women through improving how and where services are provided, particularly in rural areas and for poor women.
- It also requires tackling the ways in which services are delivered through the attitudes and actions of health care providers.

Good reporting of a mixed methods study

Describe:

- the justification for using a mixed methods approach
- the design in terms of the purpose, priority and sequence of methods
- each method in terms of sampling, data collection and analysis
- where integration has occurred, how it has occurred and who has participated in it
- any limitation of one method associated with the presence of the other method
- any insights gained from making or integrating methods

O’Cathain et al. Journal of Health Services Research & Policy Vol 13 No 2, 2008: 92–98

Potential weaknesses of mixed methods

- Quantitative questions may end up measuring different constructs to qualitative.
- Costs can be high.
- Problems in managing to synthesise quantitative and qualitative findings.
- Lack of integration in many studies.

Summary

- Quantitative and qualitative research methods have traditionally been associated with conflicting research paradigms
- Mixed methods approaches can be based upon different types of research question, sampling procedures, data collection methods or approaches to data analysis.
- Mixed methods designs are flexible
- Mixed methods designs should be based upon the kinds of questions being addressed and how the design can aid in the answering of these questions.