

Clinical Research Seminar Presentation

A SPECTRUM OF MIXED METHODS RESEARCH DESIGNS

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Objectives of this Presentation

- 1) To develop a basic understanding of mixed methods designs, and to be able to apply that to research design
- 2) To understand the types of questions that are best answered using quantitative, qualitative, and mixed methods
- 3) To be able to list quantitative vs qualitative data types and typical approaches for mixing them
- 4) To be aware of resources available to support the development of mixed methods research



Outline of this Presentation

- Overview of Mixed Methods Research (20 min)
- Activity (20 min)
 - 3 case studies
- Discussion (15 min)
 - Local resources for mixed methods research



Overview of Mixed Methods Research

Quantitative Research

Quantitative research is a structured way of collecting and analyzing data obtained from different sources. Quantitative research involves the use of computational, statistical, and mathematical tools to derive results. It is conclusive in its purpose as it tries to quantify the problem and understand how prevalent it is by looking for projectable results to a larger population.

SIS International, accessed 2018

Qualitative Research

Qualitative research involves an interpretive, naturalistic approach to the world. This means that qualitative researchers study things in their natural settings attempting to make sense of, or interpret, phenomenon in terms of the meanings people bring to them.

Denzin and Lincoln, 2003

Differences in Qualitative and Quantitative Research Methodology

Quantitative Methods

- Answers questions about “What?” and “Who?” and “Which?”
- Conducted during later phases of research process
- Data collection and data analysis can be quick
- Asking close-ended questions (Yes/No, on a scale of 1-10, ratings, which of these options)
- Large sample sizes
- Objective data—goal is to get precise measurements and analyses

Qualitative Methods

- Answers questions about “How” and “Why” something occurs
- Exploratory, way to understand what research questions are relevant for a population
- Lengthy data collection and analysis
- Questions are open-ended
- Sample size is smaller and more focused
- Subjective data—the experience and interpretation of events is at the center

Data Types

Quantitative

9 6.3 4 2 7 2 3 1 1 2 3 4 2 8 3 4 1
1 1 5 3 4 1 2 3 1 4 4 5 5 4 1 2 1
9.1 3 3 5 1 4 2 3 1 3 5 2 2 1 5 3 5
1 3 1 5 11 5 2 5 1 3 2 4 4 3 1 2 4
2 2 1 9 6 4 2 1 3 7

Statistics, p values

Clean data

Qualitative

Text, like visit summaries, office notes, open-ended surveys, journal entries, transcribed interviews.

Or, photos, videos, audio recordings, drawings, naturalistic observations.

Narratives looking for patterns.

Collecting Data

Quantitative data

- Surveys
- Checklists
- Records
- Spreadsheets
- Databases
- Questionnaires

Qualitative data

- Interviews
- Focus Groups
- Field Notes
- Observations
- Documents
- Drawings
- Audio-visual materials

Analyzing Data

Quantitative

Use statistical analyses for,

- Describing/characterizing
- comparing groups
- relating variables
- prediction

Qualitative

Use text and images for,

- coding
- theme development
- relating themes

Inductive vs. Deductive Research Processes

Inductive/Qualitative approach:

Observation of phenomenon → detecting a pattern → develop a tentative hypothesis → form a general theory

Deductive/Quantitative approach:

Known idea or theory exists → apply to situation to test a hypothesis → observe results → confirm results

Mixed methods can allow for both processes to occur either simultaneously or be used in a cyclical manner.

Mixed Methods Research

as a method, it focuses on collecting, analyzing, and mixing both quantitative and qualitative data in a single study or series of studies. It's central premise is that the use of quantitative and qualitative approaches, in combination, provides a better understanding of research problems than either approach alone.

Mixed Methods Research

- Collect and analyze both quantitative and qualitative data.
- Mix the two forms of data in different ways.
- Give priority to one, or both, forms of data.
- Can be done as a single study or in multiple phases of a study.

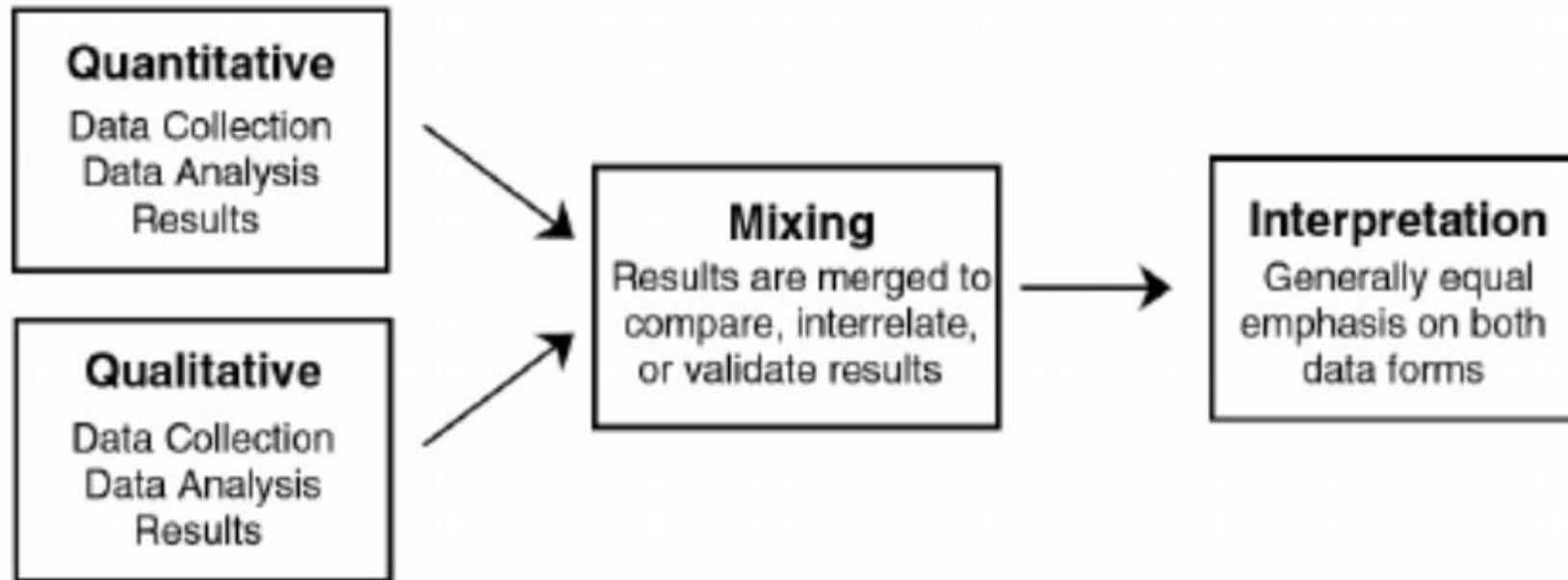
Why use Mixed Methods?

- One data source may not be enough
- Initial results need to be further explained
- A second method is needed to enhance a finding

4 Major Mixed Methods Designs

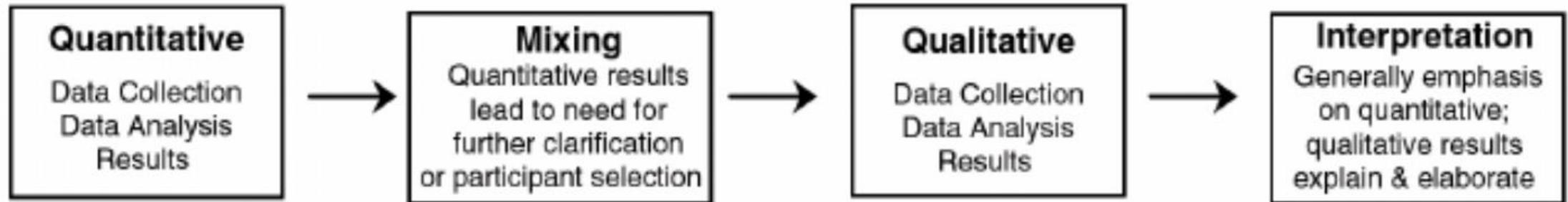
1. Convergent Parallel (Triangulation) Design
2. Explanatory Sequential Design
3. Exploratory Sequential Design
4. Embedded Design

Convergent Parallel Design



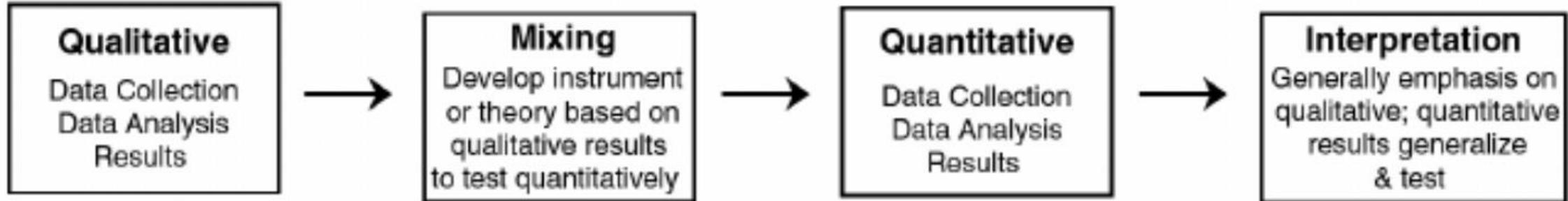
Creswell and Plano Clark, 2007

Explanatory Sequential Design



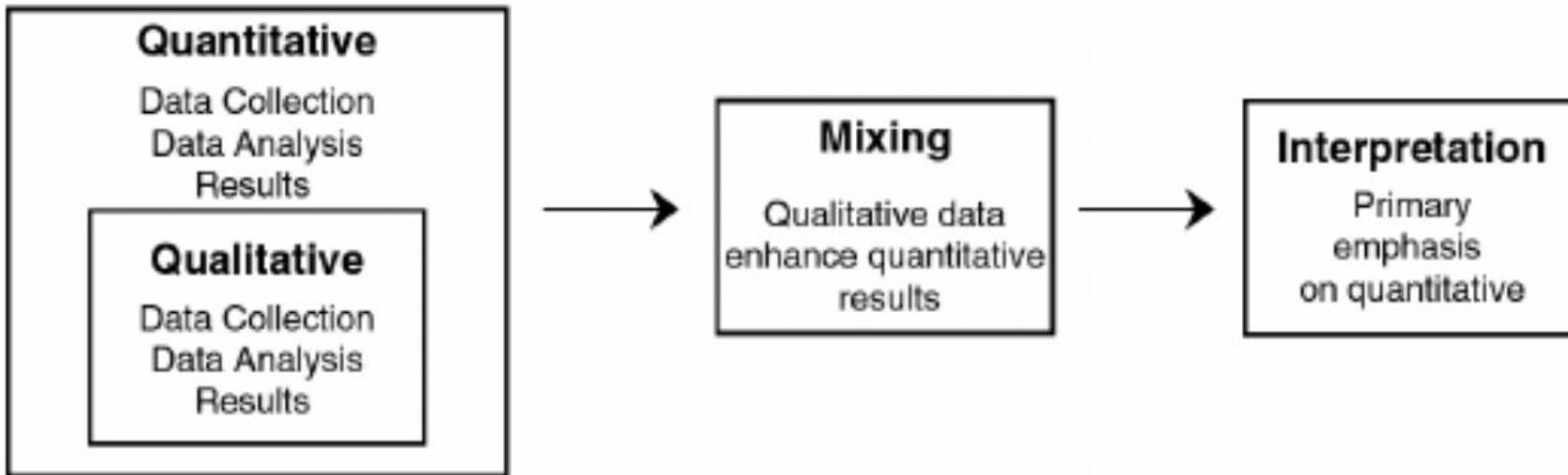
Creswell and Plano Clark, 2007

Exploratory Sequential Design



Creswell and Plano Clark, 2007

Embedded Design



Creswell and Plano Clark, 2007

Planning a Mixed Methods Design

1. What is your research question?
2. What are your data sources?
3. When are you collecting and analyzing your data?
4. Does your research team have the appropriate expertise?

Case Study: Autism Support Checklist at BMC

Background

- Patients with autism have higher rates of hospitalization and virtually all medical conditions, except for cancer (Croen, Najjar, & Ray, 2006; Kogan et al., 2008; Liptak, Stuart, & Auinger, 2006).
- Hospital visits can be a stressful and overwhelming experience for patients with autism and their caregivers (Vaz, 2010), especially if healthcare professionals are not well prepared to interact with patients with autism and their families (Broder-Fingert et al., 2014).
- Through the Autism Friendly Initiative at Boston Medical Center, we created the Autism Support Checklist (ASC), which is a needs assessment tool that gathers information about unique sensory, communication, and safety needs of patients with autism through their caregivers. Information from the ASC is entered into the patient's medical records and is accessible to clinicians through EPIC.



Autism Support Checklist

Communication

1. Does the patient communicate using spoken language?

- Yes
- No
- Please explain: _____

2. What other ways does the patient communicate?

- Pictures
- Written Words
- Device/Tablet
- Gestures/Signs
- Other: _____

3. What would help the patient understand information?

- Spoken language
- Pictures
- Written Words
- Device/Tablet
- Gestures/Signs
- Other: _____

4. How does the patient communicate pain?

- Spoken language
- Crying/Screaming
- Self Injury
- Aggression
- Other: _____

Sensory Needs

5. Does the patient have sensory triggers/needs?

- Avoid bright lights
- Avoid loud noises
- Avoids touch
- Seeks pressure
- Other: _____

6. What items/actions would be helpful?

- Sunglasses
- Headphones
- Stress Ball
- Other: _____

Interacting with the Patient

7. What would help the patient understand the procedure/exam?

- Talk the patient through the exam
- Demonstrate on another person
- Show a picture schedule
- Other: _____

8. Are there particular actions or phrases that are likely to trigger the patient?
(e.g. people speaking loudly)

- Yes? Please explain:
- No

9. Does the patient engage in behaviors that could be a safety concern?

- Bolting
- Self-injurious behaviors
- Hitting, kicking etc.
- Other: _____

10. What other information should we know to help make the patient more comfortable?

Case Study: Autism Support Checklist at BMC

Team Research Questions:

1. How effective was the Autism Support Checklist in helping clinicians modify their behavior to accommodate the communication, sensory, and safety needs of their patients with autism?
2. What is the most effective implementation/delivery method of the Autism Support Checklist to ensure high usage by clinicians?

How would you design a study to answer these questions?

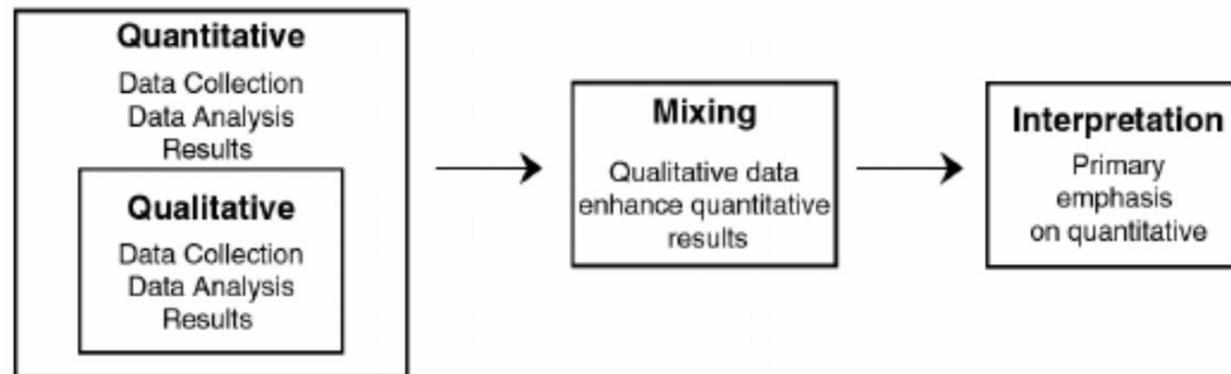
Case Study: Autism Support Checklist at BMC

What we did:

Sampling patients: We recruit patients who (1) already have their Autism Support Checklist information entered into EPIC and (2) have an appointment within the next 6 months.

Sampling clinicians: (1) We identify the clinicians with whom these patients will have an appointment. (2) We randomly assign these clinicians into 2 groups: (1) high intensity group (receive an in-person Autism Support Checklist training) or (2) low intensity group (receive an email about Autism Support Checklist)

Measures: Online survey for clinicians; phone survey for patients' caregivers asking how their appointment went. Surveys contain both close-ended, quantitative items and open-ended, qualitative items.



Examples of survey items (clinician version)

Exposure/Access Questions

Did you have a chance to read the patient's Autism Support Checklist data on EPIC?

Autism Support Checklist Effectiveness Questions

User satisfaction

How useful was the information in the Autism Support Checklist in helping you interact with your patients with autism? (1 = not useful, 4 = very useful)

Process measure

Did you change your interaction with the patient because of what was listed in the Autism Support Checklist?

If yes, how? Please check all that apply:

- I understood that my patient was trying to communicate with me
- I understood the **cues** that the patient used to communicate pain (e.g., crying, aggression) that were listed on the Autism Support Checklist.
- I modified the way I **communicated** to accommodate the patient (e.g., lower tone of voice, used pictures).

Free-text Questions

Do you have other comments or suggestions about improving the Autism Support Checklist? (Optional)

Case Study: Autism Support Checklist at BMC

Lessons Learned:

- Balancing conciseness and comprehensiveness of a measure
- Engaging stakeholders, incorporating and balancing different input and perspectives

Case Study: Adolescent Substance Use in Liberia

Background:

Following the civil war in Liberia, a research team in USA with partnerships in Liberia was hearing from clinicians and other health workers that there were very high rates of substance use by Liberian adolescents. The research team wanted to understand the what these rates were and which substances were being used in Liberian adolescents.

They administered an American substance use measure with a representative sample adolescents and found rates of substance use (including alcohol) were much lower than expected. This seemed very discrepant to what seemed to be widely observed by those who worked with Liberian adolescents.

Case Study: Adolescent Substance Use in Liberia

Questions from the Research

What next steps could the research team take to better answer their research questions?

What may have been limitations of the old design?

How might mixed methods research be able to determine the accuracy of the previous results?

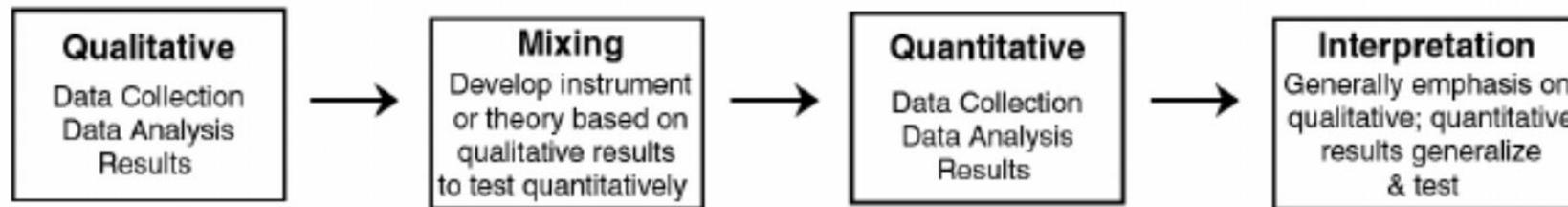
Case Study: Adolescent Substance Use in Liberia

What Happened

The research team conducted qualitative interviews with Liberian adolescents about their substance use behaviors and found that the American screening tool had not been probing about substances by their names, particularly the street names, used in Liberia. Additionally, “Heroin” in Liberia was sometimes used as a catch all term to describe drugs in general as opposed to the drug, Heroin.

When interviewed, the Liberian adolescents described a number of alcoholic beverages and drugs that young people were using that were not well probed for in the American substance use assessment.

The research team used the information that was captured in the interviews to develop a Liberian substance use assessment that is currently being administered. The research team will compare the results of the new assessment and determine how the results might generate new qualitative and quantitative research questions.



Case Study: Adolescent Substance Use in Liberia

Lessons Learned From Liberia

When making language or cultural adaptations to a measure, a qualitative component to the research design can be a way to determine validity

Study team learned about more substances used and substance use behaviors in the Liberian adolescents which helped study team identify a number of potential research questions.

Similar methodologies helped our team with other African groups. Example: in a community in Ethiopia there was a 5:1 ratio of men to women being diagnosed with schizophrenia but world-wide that ration is ~1:1. In a study of African immigrants and refugees in Lowell, MA participants endorsed qualifying symptoms for depression in qualitative interviews at higher rates than the same participants endorsed depressive symptoms on a depression screener.

Case Study: Integrating Behavioral Health in Primary Care

Background

Does Integrating Behavioral Health in Primary Care Practices Improve Patient Centered Outcomes?

- Pragmatic, randomized-control trial
- 40 participating primary care practices (20 active, 20 control)
- 3,000 patients
- Practice level intervention: Quality Improvement Practice Change Process

Case Study: Integrating Behavioral Health in Primary Care

Background - Data Sources

Baseline, Midpoint, Follow-up

- Patient Surveys (i.e. validate instruments: PHQ9, PROMIS29)
- Patient Electronic Health Record data (i.e. blood pressure, medications, visit dates)
- Practice Surveys (i.e. PIP, Practice Characteristics: size, type, number of providers)

Follow-up

- Site Visits: select ~10 practices to visit – observations & structured interviews

Ongoing

- Field notes (meeting notes, research administration notes, emails, communications)

Case Study: Integrating Behavioral Health in Primary Care

Questions to discuss:

What contextual factors support or impede successful behavioral health integration, and how?

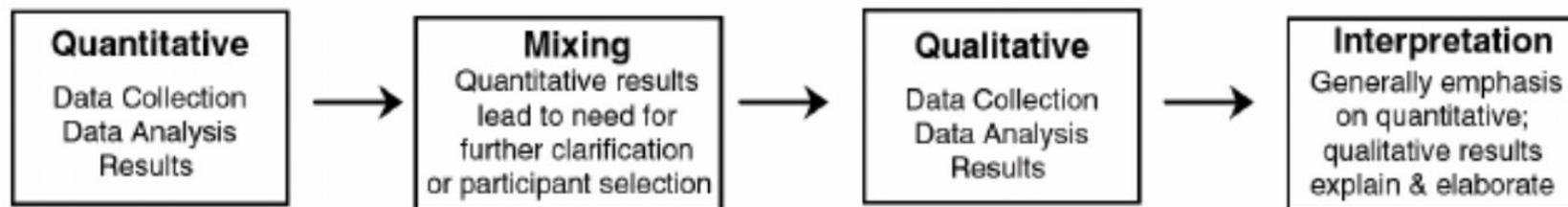
- What do we mean by “contextual factors”?
- What data sources can we use to answer this question?
- How will we choose what practices to include?
- What type of mixed methods design might we consider?

Case Study: Integrating Behavioral Health in Primary Care

Lessons Learned:

What contextual factors support or impede successful behavioral health integration, and how?

- Contextual Factors: Leadership support, organizational culture, experience with practice change, office space, ...
- Data Sources: all of them....but primarily site visit interviews and observations.
- How will we choose what practices to include: PIP & field notes
- What type of mixed methods design might we consider: Explanatory



Resources:

- Technological Resources
 - NVivo
 - SPSS, R, Stata, SAS
 - Dedoose
 - Atlas
- Human Capital
- Use the library!

Any other resources folks are aware of?

Resources: Books

“Qualitative Inquiry and Research Design: Choosing Among Five Approaches” by John W. Creswell

“Qualitative Data Analysis: A Methods Source Book” by Matthew B. Miles, A. Michael Huberman, and Johnny Saldana

“Qualitative Research Methods” by Monique Hennink, Inge Hutter, and Ajay Bailey

“Mixed Methods in Health Sciences Research: A Practical Primer” by Leslie Curry and Marcella Nunez-Smith

Thank You
