

# Mixed Methods:

Integrating Quantitative and Qualitative  
Data Collection and Analysis  
While Studying Patient-Centered  
Medical Home Models



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# Mixed Methods: Integrating Quantitative and Qualitative Data Collection and Analysis While Studying Patient-Centered Medical Home Models

This brief focuses on using mixed methods to evaluate patient-centered medical home (PCMH) models. It is part of a series commissioned by the Agency for Healthcare Research and Quality (AHRQ) and developed by Mathematica Policy Research under contract, with input from other nationally recognized thought leaders in research methods and PCMH models. The series is designed to expand the toolbox of methods used to evaluate and refine PCMH models. The PCMH is a primary care approach that aims to improve quality, cost, and patient and provider experience. PCMH models emphasize patient-centered, comprehensive, coordinated, accessible care, and a systematic focus on quality and safety.

## I. Mixed Methods Studies

The term “mixed methods” refers to an emergent methodology of research that advances the systematic integration, or “mixing,” of quantitative and qualitative data within a single investigation or sustained program of inquiry. The basic premise of this methodology is that such integration permits a more complete and synergistic utilization of data than do separate quantitative and qualitative data collection and analysis. The evaluation of PCMHs provide an ideal opportunity for mixed methods studies to contribute to learning about best practices in how to implement a PCMH as well as PCMH effectiveness in achieving the triple aim outcomes of cost, quality, and patient experience of care.

Mixed methods research originated in the social sciences and has recently expanded into the health and medical sciences including fields such as nursing, family medicine, social work, mental health, pharmacy, allied health, and others. In the last decade, its procedures have been developed and refined to suit a wide variety of research questions (Creswell and Plano Clark, 2011). These procedures include advancing rigor, offering alternative mixed methods designs, specifying a shorthand notation system for describing the designs to increase communication across fields, visualizing procedures through diagrams, noting research questions that can particularly benefit from integration, and developing rationales for conducting various forms of mixed methods studies.

The core characteristics of a well-designed mixed methods study in PCMH research include the following:

1. Collecting and analyzing both quantitative (closed-ended) and qualitative (open-ended) data.
2. Using rigorous procedures in collecting and analyzing data appropriate to each method's tradition, such as ensuring the appropriate sample size for quantitative and qualitative analysis.
3. Integrating the data during data collection, analysis, or discussion.
4. Using procedures that implement qualitative and quantitative components either concurrently or sequentially, with the same sample or with different samples.

5. Framing the procedures within philosophical/theoretical models of research, such as within a social constructionist model that seeks to understand multiple perspectives on a single issue—for example, what patients, caregivers, clinicians, and practice staff would characterize as “high-quality treatment” in a PCMH.

This brief focuses on the potential uses of this methodology for PCMH research as well as on specific mixed methods designs in primary care research (Creswell, Fetters, and Ivankova, 2004) that offer feasible, information-rich data that can enhance traditional quantitative research approaches.

## II. Uses of Mixed Methods Research Designs

Mixed methods can be an ideal technique to assess complex interventions such as PCMHs (Homer, Klatka, Romm, et al., 2008; Nutting, Miller, Crabtree, et al., 2009). PCMH evaluators can choose from five primary mixed methods designs depending on the research questions they want to answer and resources available for the evaluation.

**Validate findings using quantitative and qualitative data sources.** Evaluators can use a *convergent design* to compare findings from qualitative and quantitative data sources. It involves collecting both types of data at roughly the same time; assessing information using parallel constructs for both types of data; separately analyzing both types of data; and comparing results through procedures such as a side-by-side comparison in a discussion, transforming the qualitative data set into quantitative scores, or jointly displaying both forms of data. For example, the investigator can gather qualitative data to assess the personal experiences of patients while also gathering data from survey instruments measuring the quality of care. The two types of data can provide validation for each other and also create a solid foundation for drawing conclusions about the intervention.

**Use qualitative data to explore quantitative findings.** This *explanatory sequential design* typically involves two phases: (1) an initial quantitative instrument phase, followed by (2) a qualitative data collection phase, in which the qualitative phase builds directly on the results from the quantitative phase. In this way, the quantitative results are explained in more detail through the qualitative data. For example, findings from instrument data about costs can be explored further with qualitative focus groups to better understand how the personal experiences of individuals match up to the instrument results. This kind of study illustrates the use of mixed methods to explain qualitatively how the quantitative mechanisms might work.

**Develop survey instruments.** Yet another mixed methods study design could support the development of appropriate quantitative instruments that provide accurate measures within a PCMH context. This *exploratory sequential design* involves first collecting qualitative exploratory data, analyzing the information, and using the findings to develop a psychometric instrument well adapted to the sample under study. This instrument is then, in turn, administered to a sample of a population. For example, a PCMH study could begin with a qualitative exploration through interviews with primary care providers to assess what constructs should be measured to best understand improved quality of care. From this exploration, an instrument could be developed using rigorous scale development procedures ( DeVellis, 1991) that is then tested with a sample. In this way, researchers can use a mixed methods approach to develop and test a psychometric instrument that improves on existing measures.

**Use qualitative data to augment a quantitative outcomes study.** An outcomes study, for example a randomized, controlled trial, with qualitative data collection and analysis added, is called an *embedded design*. Within this type of an outcomes study, the researcher collects and analyzes both quantitative and qualitative data. The qualitative data can be incorporated into the study at the outset (for example, to help design the intervention); during the intervention (for example, to explore how participants experience the PCMH model); and after the intervention (for example, to help explain the results). In this way, the qualitative data augment the outcomes study, which is a popular approach within implementation and dissemination research (Palinkas, Aarons, Horwitz, et al., 2011).

**Involve community-based stakeholders.** A community-based participatory approach is an example of a *multiphase design*. This advanced mixed methods approach involves community participants in many quantitative and qualitative phases of research to bring about change (Mertens, 2009). The multiple phases all address a common objective of assessing and refining PCMH models. This design would involve primary care providers and staff, patients, and other providers and individuals in the community in the research process. Key stakeholders participate as co-researchers in a project, providing input about their needs, ways to address them, and ways to implement changes.

These five research designs apply mixed methods approaches to evaluations of PCMH models. The literature details their procedures, illustrates the flow of activities through the use of shorthand notation, and reflects on strengths and limitations.

### III. Advantages

Using a mixed methods study has several advantages, which we discuss below.

**Compares quantitative and qualitative data.** Mixed methods are especially useful in understanding contradictions between quantitative results and qualitative findings.

**Reflects participants' point of view.** Mixed methods give a voice to study participants and ensure that study findings are grounded in participants' experiences.

**Fosters scholarly interaction.** Such studies add breadth to multidisciplinary team research by encouraging the interaction of quantitative, qualitative, and mixed methods scholars.

**Provides methodological flexibility.** Mixed methods have great flexibility and are adaptable to many study designs, such as observational studies and randomized trials, to elucidate more information than can be obtained in only quantitative research.

**Collects rich, comprehensive data.** Mixed methods also mirror the way individuals naturally collect information—by integrating quantitative and qualitative data. For example, sports stories frequently integrate quantitative data (scores or number of errors) with qualitative data (descriptions and images of highlights) to provide a more complete story than either method would alone.

### IV. Limitations

Mixed methods studies are challenging to implement, especially when they are used to evaluate complex interventions such as a PCMH model. Below we discuss several challenges.

**Increases the complexity of evaluations.** Mixed methods studies are complex to plan and conduct. They require careful planning to describe all aspects of research, including the study sample for qualitative and quantitative portions (identical, embedded, or parallel); timing (the sequence of qualitative and quantitative portions); and the plan for integrating data. Integrating qualitative and quantitative data during analysis is often a challenging phase for many researchers.

**Relies on a multidisciplinary team of researchers.** Conducting high-quality mixed methods studies requires a multidisciplinary team of researchers who, in the service of the larger study, must be open to methods that may not be their area of expertise. Finding qualitative experts who are also comfortable discussing quantitative analyses and vice versa can be challenging in many environments. Given that each method must adhere to its own standards for rigor, ensuring appropriate quality of each component of a mixed methods study can be difficult (Wisdom, Cavaleri, Onwuegbuzie, et al., 2011). For example, quantitative analyses require much larger sample sizes to obtain statistical significance than do qualitative analyses, which require meeting goals of saturation (not uncovering new information from conducting more interviews) and relevance. Embedded samples, in which a qualitative subsample is embedded within a larger quantitative sample, can be useful in cases of inadequate statistical power.

**Requires increased resources.** Finally, mixed methods studies are labor intensive and require greater resources and time than those needed to conduct a single method study.

## V. Conclusion

The integration of quantitative and qualitative data in the form of a mixed methods study has great potential to strengthen the rigor and enrich the analysis and findings of any PCMH evaluation. By carefully selecting the mixed method design that best suits the evaluation's questions and meets its resource constraints, evaluators can facilitate deeper, more meaningful learning regarding the effectiveness and implementation of PCMH models.

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## VII. Resources

### **Application of Mixed Methods to PCMHs**

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