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Supplemental Appendix. Clarification of Whole System Participatory Action Research

Participatory action research (PAR) requires that “some of the people in the organization or community under study participate actively with the professional researcher throughout the research process from the initial design to the final presentation of results and discussion of their action implications.”¹ PAR may be the same thing as *participatory research*, a term commonly used in the USA² and in developing countries.³ *Action research* is a less useful term, because it is used with different meanings,⁴ including any research that should lead to action, which arguably should be all research.

The term *system* refers to the “people and organizations that connect around a shared purpose,”⁵ whereas the term *whole* implies that perspectives from the whole system of concern take part. Whole system participatory action research therefore includes inquiries that actively seek participation of people from throughout the whole system of concern, at all stages of an inquiry. In this project, the perspectives of relevance changed as the understanding of the whole system of concern changed, which makes it an open and evolving systemic inquiry where a broad diversity of people make sense of a diversity of research insights through “networks of conversations.”⁶ In other instances the research concern might require that participants remain largely the same—as in a cooperative inquiry.⁷ All types of research methods can be embedded within this ongoing cycle of reflection and action; the distinctive feature is not the data-gathering methods but ongoing whole system participation, reflection, and action. Different ways to facilitate whole system reflection and action have been described.^{5,8-11}

PAR introduces the idea of a research community in which people of different backgrounds puzzle together about a research question.¹² Participation of people who have different perspectives is particularly valuable when complex and contested phenomena are involved. At the start of a research project, participants with different insights can challenge the original assumptions of the researchers and produce a better research question than was conceived initially. At the stage of data gathering, different participants can help access different places. At the stage of acting on findings, the ownership gained through participation encourages complementary kinds of implementation. Ongoing conversations between different perspectives can also generate new knowledge and stimulate innovation by helping participants to see their own context with new eyes and test out new things based on these new understandings. Knowledge generated in this way is termed *socially constructed*.¹³

Commonly, PAR does not answer one single research question but involves a series of inquiries about a real-life development that concerns a research community. Research questions are framed after the community has reflected on the findings of a previous cycle, producing “spirals of self-reflective cycles of planning a change ... observing the consequences of the change ... reflecting on the consequences ... re-planning...”¹⁴

In this project, annual stakeholder conferences scheduled long in advance were used to crystallize¹⁵ a rich picture from a set of research projects. At the conferences, information-rich participants from different parts of the health care system throughout London and beyond (including those who had no previous involvement with the research) debated the meaning of the data in the light of their own experiences. This endeavor had the twin effect of validating conclusions and helping to design the next research phase (Table 1), which is a feature of participatory action research.¹

Agreement about the overall meaning of multiple insights was publicly noted (and affirmed through a show of hands) during the plenary session. This affirmation reflects the final formal validation of conclusions, but the vote alone is inadequate validation. Instead, consensus emerges at

the end of interdisciplinary reflections on insights from the project. In the moment these affirmations are obvious demonstrations of group consensus, and voting is a formality. It is less obvious how to ensure from a distance that these moments have properly emerged and not been forced through by strong voices.

The notion of crystallization of meaning differs in an important respect from the notion of triangulation.¹⁶ The term *triangulation* comes from surveying. Three points are checked against each other with the same instrument to pinpoint something of interest, such as the height of a mountain. The term *crystallization* comes from the image of crystals spontaneously emerging from the multiple unknown components of a saturated solution. Triangulation emphasizes the identification of one objective truth, whereas crystallization emphasizes the context in which multiple truths may be simultaneously relevant. It encourages a researcher to build a rich picture where different insights are recognized to be part of more complex wholes. Crystallization challenges the idea that the purpose of research is to uncover discrete stand-alone truths. Instead, it implies that research is a dynamic process with an unpredictable trajectory, providing windows into more complex, evolving stories, in the same way that a photograph might capture something important about a feature film. The potential of this approach to crystallize meaning for a research community offers one way to reconcile research insights that have “differences in underlying assumptions, worldviews, and epistemology.”¹⁷

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