Community perceptions matter: a mixed-methods study using local knowledge to define features of success for a community intervention to improve quality of care for children under-5 in Jigawa, Nigeria

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ABSTRACT

Objectives In this study, we used the information generated by community members during an intervention design process to understand the features needed for a successful community participatory intervention to improve child health.

Design We conducted a concurrent mixed-methods study (November 2019–March 2020) to inform the design and evaluation of a community–facility linkage participatory intervention.

Setting Kiyawa Local Government Area (Jigawa State, Nigeria)—population of 230 000 (n=425 villages).

Participants Qualitative data included 12 community conversations with caregivers of children under-5 (men, older and younger women; n=9 per group), 3 focus group discussions (n=10) with ward development committee members and interviews with facility heads (n=3). Quantitative data comprised household surveys (n=3464) with compound heads (n=1803) and women (n=1661).

Results We analysed qualitative data with thematic network analysis and the surveys with linear regression—results were triangulated in the interpretation phase. Participants identified the following areas of focus: community health education; facility infrastructure, equipment and staff improvements; raising funds to make these changes. Community involvement, cooperation and empowerment were recognised as a strategy to improve child health, and the presence of intermediate bodies (development committees) was deemed important to improve communication and solve problems between community and facility members. The survey showed functional community relations' dynamics, with high levels of internal cohesion (78%), efficacy in solving problems together (79%) and fairness of the local leaders (82%).

Conclusions Combining the results from this study and critical theories on successful participation identified community-informed features for a contextually tailored community–facility link intervention. The need to promote a more inclusive approach to future child health interventions was highlighted. In addition to health education campaigns, the relationship between community and healthcare providers needs strengthening, and development committees were identified as an essential feature for successfully linking communities and facilities for child health.

Trial registration number ISRCTN39213655.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This study uses a bottom-up approach to include the voices of prospective participants in the design phase of a participatory intervention, to avoid a common pitfall of this type of intervention. Existing theory on health participation tends to be developed externally and applied locally. This often means that the voices and perspectives of actors who will be engaging in the participatory process are not taken into account, which can result in unsuccessful community health participatory approaches.

⇒ The use of mixed methods allowed us to understand and interpret the community needs and relational dynamics from a comprehensive perspective, which led to a meaningful co-development of the participatory intervention design.

⇒ There were some challenges with the analysis of Likert-type questions: we decided to exclude two negatively framed questions from the analysis due to contrasting response. This could have been due to respondents' misinterpretation of the questions or to a common bias of Likert-type questions (respondents consistently choosing the same answers). The latter would have devalued the data. We were able to overcome this issue by triangulating the results, thanks to the mixed methods nature of the study, which confirmed the likelihood of thoughtful responses rather than automatic ones—the general positive questionnaire answers were substantiated by feelings expressed during the focus group discussions.

⇒ The context-tailored framework we built limits the generalisability of our results to other settings, although the process we followed—inclusion of the prospective participants' voices from the formative phase and a focus on understanding the context—can be replicated elsewhere.

INTRODUCTION

Community participation is a social process in which groups of people with shared needs and contexts actively identify what their necessities are and make decisions or take collective actions to address them.[1 2] In the healthcare sector, community participation has been recognised as a core element of strategies that aim at achieving better health for all.[3] Community members, as potential service clients, can be involved in healthcare-related decision-making at all levels, from organisational to policymaking, with the aim to promote greater awareness of their own health needs and rights, and accountability and trust towards the healthcare system. Raising awareness of their needs should result in resources being prioritised to resolve the actual challenges people face, and therefore more equitable and purposeful relationships with local healthcare providers and healthcare delivery.[4] Additionally, the more local communities gain knowledge, capacity and consciousness of their rights, the more they can become empowered to bring societal and political changes, and subsequent improvements in quality of life.[5]

Most programmes aimed at improving health should ideally incorporate community participation.[6 7] Yet, in many instances so far, such participation has been promoted and implemented following abstract frameworks that do not stem from actual realities, but follow scholarly theories not rooted in the local contexts.[8] In fact, participatory approaches have faced many critiques concerning their implementation. It has been argued that participation can often be tokenistic and formal, failing to disrupt the status quo and enable the recipient communities to exercise the leadership needed to create transformative and long-lasting change.[9 10] Programmes built from theories generated from general assumptions rather than local realities recurrently fail to consider the contextual needs of target populations, ignore community relationships and dynamics, and ultimately jeopardise potential impact and sustainability.[11–13] Theories need to incorporate contextual knowledge and relevant practical factors to a priori assumptions.[14 15] When there is no deep understanding of the local context[16 17] and when the voices of prospective participants do not contribute to plan such implementations in a bottom-up way,[18] participation cannot be achieved. Therefore, participatory interventions need to be carefully designed and implemented to achieve sustainable growth, combining existing theories with specific realities.

Evidence suggests several factors that are critical to the success of participatory interventions including an understanding of existing capacity and general structure of communities. Nastasi *et al*'s model, for example, acknowledges how important cultural specificity, power dynamics and community members' interactions and needs are for the acceptability of a participatory intervention.[19] Elsewhere, a sense of community and ability to work together,[20] organisational and leadership structures and trust,[21] shared history and values[22] have also been identified as essential to building sustainable and efficient participatory interventions.[23 24] Evidence from the child health literature corroborates these findings, showing how community cohesion plays a role in maternal and child health.[25–27]

Crucially, Campbell and Cornish's framework on community mobilisation emphasises the importance of a supportive social context to improve health while also presenting a fresh outlook on the key areas participatory programmes should prioritise. This framework not only highlights hindering factors for participation, but also explains what the focus of community participation programmes should be. On top of (1) building social capital, (2) creating transformative spaces for dialogue and (3) empowering participants, these interventions need to engage with the local context at symbolic (tackling meanings, ideologies, local beliefs and stigmatisation), material (addressing poverty, focusing on economic empowerment by participating in the project) and relational (shifts in leadership and decision-making, dialogue and positive links with outside agencies) levels.[28] For its hands-on and proactive approach, we chose to adopt and adapt this framework to inform and guide our intervention design and evaluation strategies.

'Community conversations' (CCs), which have been used to meaningfully integrate community voices in the design, development and implementation of projects, are a methodology with the potential to implement Campbell and Cornish's call to focus on local contexts. The approach is based on Freire's pedagogical concept that critical consciousness, gained through education, is a prerequisite to achieve social changes.[29] Through the use of dialogical and interactive group activities, CCs provide a platform for community members to identify, debate and in some cases, plan for action in response to their own needs, with the support of a trained facilitator.[30] This encourages critical thinking among participants, offering a safe space for confrontation and networking among different community members, including those more marginalised. Dialogues are the starting point to refine perspectives and develop local consensus around key issues and collectively develop tailored solutions to locally defined problems, which when implemented can lead to lasting community empowerment.[31–33]

Though typically used as an intervention itself, we adapted this CC method during the formative phase (prior to finalising the intervention strategy) of a randomised controlled trial evaluating the impact of a complex participatory intervention (Participatory Learning and Action (PLA) cycles with an embedded community–facility linkage component) to reduce under-5 mortality in Jigawa State, Nigeria (the INSPIRING Jigawa trial).[34] Our aim was to guide the design of a participatory approach thanks to this community-led process to defining parts of the intervention, offering an example of how to overcome tokenism in concept testing and formative research during intervention design.[35]

In this paper, we aimed to understand the community context of decision-making and care-seeking patterns

related to child health based on the belief that doing so would enable us to design a locally appropriate and high-impact community participation intervention to help improve quality of care for children. First, we explored community perceptions towards the nature of relationships between services and citizens through qualitative conversations, interviews and focus group discussions (FGDs) with caregivers of under-5 children. Second, we examined community relational dynamics (community cohesion, efficacy, leadership and collective action) that could support or hinder the success of participatory interventions through household surveys with community members. In doing so, we sought to generate local knowledge which could illuminate the symbolic and relational dynamics that often derail participatory interventions. We used these mixed-methods data to adapt Campbell and Cornish's existing theory on community mobilisation to generate a locally defined framework to determine what a participatory intervention in that setting should focus on. This context-tailored framework will serve as a benchmark for later evaluations of the community–facility link participatory intervention[36] co-designed with community members in order to reduce under-5 mortality linked to pneumonia. We will use it to to understand whether the intervention was actually focused on the issues highlighted in this study.

METHODS

We conducted a concurrent mixed-methods study of qualitative CC data and quantitative household surveys collected between November 2019 and March 2020 in Kiyawa Local Government Area (LGA), Jigawa State, Nigeria. The qualitative data provided an understanding of community, village development committee (VDC) and healthcare workers' perspectives towards a participatory intervention aiming at strengthening the relationship between communities and healthcare facilities. The quantitative data measure community capacity, including community relationships, empowerment and trust in the health system. These features reflect common processes associated with participatory engagement, which underpin the proposed intervention. The surveys conducted sought to assess the readiness to implement these common processes from the perspective of compound heads and mothers. Full description of the larger INSPIRING trial has been published (ISRCTN:39213655).[34 37]

Setting

Jigawa State, located in the northwestern region of Nigeria, has 4.3 million inhabitants, 80% of whom live in rural areas. The population is composed mainly of Hausa and Fulani ethnic groups and is predominantly Muslim.[38] This study took place in Kiyawa, 1 of the 27 LGAs of the state, with a population of around 230 000 inhabitants.[39] All the 11 wards—a further administrative subdivision of LGAs—of Kiyawa were included in our research. Jigawa State has an overall under-5 mortality rate of 192 per 1000

live births, of which 18% are due to pneumonia,[40] substantially higher than under-5 mortality rate at national level (120 deaths per 1000 live births).[41]

CCs (qualitative)

We used the following interactive participatory tools during the CC: body mapping, Venn diagrams and community mapping (see online supplemental table 1). These were intended to spark discussions and stimulate participants' critical thinking regarding their daily life well-being practices, experiences related to child health and relationships with healthcare providers; full methodological details of this CC adaptation are described elsewhere.[42] Concept testing FGDs aimed to stimulate a reflective discussion to identify ideal features for the intervention and confirm the validity of themes raised in other CC activities.

Participants

CCs were conducted with adult representatives of the local communities (men >18 years and women 18–49 years), who were parents or caregivers of children aged under-5 years. There were no specific exclusion criteria for the eligible community members, and we actively sought to have different ages, backgrounds and professions, including traditional leaders. The full panel of CC activities was conducted in six wards, and five concept testing FGDs were held in the remaining wards. Three additional FGDs were organised with VDC members (three different groups of maximum 10 participants—both men and women), in three wards where CC activities were carried out, and three individual interviews were carried out with the heads of primary healthcare centres (PHCs)—to include the voices of all the stakeholders who would participate in the prospective intervention.

Recruitment, sampling and data collection

Eligible participants were selected to take part using convenience sampling. The qualitative research team identified eligible participants while walking around villages with a village representative and approached them to ascertain willingness to participate and obtain consent. The aim was to recruit 10 participants per subgroup (men, older and younger women). Overall, 320 participants took part with approximately 53 participants per each conversation session. Each CC was done in three sessions 1–3 hours over 3 days. VDC members were identified and recruited through the community leaders, who described the committees existing in the communities. For the PHC heads, we used purposive sampling, selecting participants from the three busiest facilities in the LGA.

CCs, FGDs and interviews were facilitated by two research assistants, one primary facilitator guiding and mediating the discussions and one observer and note taker, with roles rotating among three members of the research team. Conversations were held in primary schools, a location chosen with village representatives before the beginning of data collection. Pictures and

material transcriptions (translated from Hausa into English) were uploaded to a secure server.

Compound surveys (quantitative)

Full methods for the compound survey are published elsewhere.[34] Briefly, we surveyed heads of compounds (the person who compound members deemed the most senior in terms of status, irrespective of age and gender (see table 1) available at the time of the data collection) and a woman with a child under-5 years from the same compound. The two groups of participants answered the questions separately. Compounds were defined as all structures and individuals of an extended family who have an element of shared resources; this often consisted of multiple dwellings.

Recruitment, sampling and data collection

All the 425 villages in Kiyawa LGA were included in the sample, with compounds selected using systematic random sampling proportional to village size, with a target sample size of 4480 compounds and a minimum of 3 compounds per village. For the woman's questionnaire, simple random sampling was done, to select one woman per compound. To be eligible, women had to be residents in Kiyawa LGA, have lived in the compound for a minimum of 3 months, be of childbearing age (16–49 years old) and have at least one child aged 0–59 months. Data were collected by 12 teams of 3 data collectors, who underwent 2 weeks' training and questionnaire piloting. The interviewer-administered surveys were filled using a customised CommCare app on Android tablets that had in-built cleaning rules. This ensured all questions needed to be answered to proceed with the surveys, to avoid missing information. Data were uploaded daily to a central secure server.

While presented with different surveys, both heads of compounds and women answered questions on community cohesion, efficacy, leadership and collective action. Heads of compounds answered additional questions on the compound structure and socioeconomics. Questions on compound structure and relationships among the people living there were answered with help from other residents, while personal information and assets questions were answered privately—to respect the privacy on more sensitive data. Women also answered their questionnaires separately within the compounds. Verbal consent was obtained from all participants after going through the informed consent form. They were duly informed that their participation is voluntary and that the collected data would be used for research purposes.

Analysis

The mixed-methods analysis applied a parallel design,[43 44] with quantitative and qualitative data analysed separately and results triangulated in the interpretation phase. While giving more emphasis on the qualitative findings, we also integrated the quantitative results to gain a comprehensive understanding of the community's readiness and receptiveness to the proposed participatory intervention. The qualitative data offered direct information on the community perceptions of the prospective implementation and on the nature of relationships between community members and healthcare providers, allowing us to grasp details of the community's needs, concerns and expectations related to the intervention. On the other hand, the quantitative data provided insights into the community's relational dynamics, giving us a broader understanding of how different factors interplay and influence the feasibility and support for a participatory intervention in the setting.

The aim of the qualitative data study was to explore the perceptions of prospective participants regarding a participatory intervention, identify the key focus areas and understand how the relationship between healthcare providers and community members can influence its design and implementation. The analysis of Venn diagram, body and community mapping was coordinated by RB, with AI, FS and AAAB as the primary analysis team. Following initial reading of transcripts, RB built a coding framework using thematic network analysis, blending inductive and deductive approaches aiming at providing information for the intervention development. The FGDs with community members (11 FGDs, n=9) and VDC members (3 FGDs, n=10) and interviews with PHC providers (n=3) were coded using a thematic network methodology by AI via NVivo.[45] After reading the transcripts, basic themes were identified, which were then grouped together in organising themes based on similarity of ideas. Finally, organising themes were combined into global themes—macro-groups to summarise the meaning of the whole text in a structured way. Data synthesised in this way were cross-checked with RB.

The objective of the quantitative data analysis was to assess community capacity characteristics in the specified setting and determine the feasibility of supporting a participatory intervention in that context. Data were described using percentages, means and 95% CIs. Data from compound heads and women were primarily analysed separately, with a combined analysis conducted as a sensitivity analysis. We excluded interviews with ineligible participants from the analysis. We calculated summary scores for the three community capacity domains: community cohesion (seven questions, score range: −14 to 14), efficacy (five questions, score range: −10 to 10) and leadership (eight questions, score range: −16 to 16). Each question within the domains was assigned a numerical value: 2 for 'strongly agree'; 1 for 'agree'; 0 for 'neutral'; −1 for 'disagree'; −2 for 'strongly disagree'. For two questions on community cohesion, which were negatively framed, the scores were inversed. As the answers for these two questions were very different from all the others, the primary analysis excluded these questions. A sensitivity analysis including them is presented in online supplemental appendix 1. We conducted adjusted linear regressions for each domain score (outcome) by the participants' characteristics. Regressions were adjusted for: age

Table 1 Demographic characteristics of compound heads and women included in the survey

		Compound head N=1803	Woman N=1661
Age	16–19		100 (6.0%)
	20–29	31 (1.7%)	781 (47.0%)
	30–39	273 (15.1%)	620 (37.3%)
	40–49	720 (39.9%)	160 (9.6%)
	50–59	416 (23.1%)	
	60–69	237 (13.1%)	
	70+	126 (6.99%)	
Gender	Male	1760 (97.6%)	
	Female	43 (2.4%)	
Main occupation	Farmer	997 (55.3%)	84 (5.1%)
	Manual labour	332 (18.4%)	592 (35.6%)
	Small business owner	240 (13.3%)	792 (47.7%)
	Traditional role*/Imam/professional	144 (8.0%)	4 (0.2%)
	Not working	90 (5.0%)	189 (11.4%)
Religion	Islam	1800 (99.8%)	1659 (99.9%)
	Christianity	3 (0.2%)	2 (0.1%)
Highest education	No education	294 (16.3%)	530 (31.9%)
	Informal/religious education	1157 (64.2%)	910 (54.8%)
	Formal education (primary/secondary/tertiary)	352 (19.5%)	221 (13.3%)
Marital status	Married	1792 (99.4%)	1651 (99.4%)
	Not married†	11 (0.6%)	10 (0.6%)
Traditional roles in the community	None	1635 (90.7%)	
	Political	75 (4.2%)	
	Healthcare	28 (1.6%)	
	Religious	65 (3.6%)	
Monthly household income	Less than 30 000 naira	946 (52.5%)	
	30 000–60 000 naira	306 (17.0%)	
	More than 60 000 naira	77 (4.3%)	
	Don't know	474 (26.3%)	
Women's personal income	Nothing		382 (23.0%)
	Less than 30 000 naira		872 (52.5%)
	30 000–60 000 naira		12 (0.7%)
	Don't know		395 (23.8%)
Access to other sources of income or resources (eg, food) for the women	No		514 (31.0%)
	Yes—within the compound		1051 (63.3%)
	Yes—outside the compound		96 (5.8%)
Wealth quintile‡ (socioeconomic status)	Lowest	377 (20.9%)	
	Low/middle	392 (21.7%)	
	Middle	340 (18.9%)	
	Middle/high	336 (18.6%)	
	Highest	358 (19.9%)	
Membership in micro-financing groups	Yes	34 (1.9%)	11 (0.66%)
	No	1769 (98.1%)	1650 (99.3%)

Continued

Table 1 Continued

		Compound head N=1803	Woman N=1661
Membership in other community organisations§	Yes		87 (5.2%)
	No		1574 (94.8%)

*Traditional healer/TBA.
†Never married/divorced/separated/widowed.
‡At compound level.
§Women's associations, health and sanitation, farmers associations.
TBA, traditional birth attendant.

group, main occupation, education level, traditional role in the community, socioeconomic status (wealth quintile generation is defined in online supplemental appendix 2), community funds membership, membership in the women's association or other community organisations. We could not calculate summary scores for the community collective action question, as the answers were not Likert scale type, nor conduct linear regression. Associations between participant characteristics and community collective action were assessed using X^2 test.

We used Campbell and Cornish's framework to provide an organising structure for the information that emerged from the analysis. Their community mobilisation theory identified symbolic, material and relational contexts as crucial for community engagement in low-resource settings. We used the participants' knowledge to understand how these broad categories translate into locally relevant factors to improve participation. We then built a framework based on this local adaptation of Campbell and Cornish theory to inform the intervention design (and evaluation at a later stage).

Patient and public involvement
Participants knew that their contribution to this research would help to set up the upcoming intervention. Thanks to the CC methodology, community members were included in the co-design process, and their answers helped to shape the details and delivery strategy of the PLA and community–facility linkage intervention.

RESULTS
Qualitative results
We organised the qualitative findings in three global themes, allowing us to identify key focus areas for the prospective participatory intervention based on the participants' perspectives. We observed how the topics resonated with the symbolic, material and relational aspects shaping community mobilisation according to Campbell and Cornish's framework, offering a local perspective on them.

Factors that hinder efforts to improve under-5 child health
All the study participants weighed in on the topic of child health. The main discussion points converged on the changes needed to improve child health and what would make child interventions successful in their local context.

Caregivers' low health education level, fitting within Campbell and Cornish's symbolic context in terms of belief systems in place, was considered one of the reasons for poor child health, with examples provided of the potential successes of creating health awareness:

> I believe lack of creating awareness to the people of the community is a serious problem, there are certain people who still don't want to accept the importance of vaccine, and this is a serious problem. (VDC member)

> When they [development project implementers] brought the supplementary diet and informed us on the kind of food to feed our children with, we saw the benefit and our children are healthier. (community member)

To obtain changes, participants identified a need to work at a collective level as much as at individual, illuminating the importance of the relational context.

> The most important thing is cooperation, because if there is cooperation between people there will be progress. (community member)

However, communities noted a need for access to sensitisation and awareness campaigns, in order to effectively cooperate and become active participants in health decisions.

> You know all these diseases, most of them is communicable and preventable disease, so if community people, especially chief Imams and traditional leaders create awareness, some of this will not occur. (PHC head)

Other issues identified at facility level reflected material and symbolic contexts. It was deemed fundamental to have material improvements (infrastructure, equipment and drug availability) as much as staff development. Health facilities need to increase the number of healthcare workers specialised in child health, healthcare providers need to establish a more cooperative relationship with the community and more female staff are needed:

There is lack of females in the health sector, when a woman comes to the facility you mostly find male health workers; we wish to have more females. (VDC member)

Once these key issues were identified, participants highlighted that compelling economic reasons prevent real changes from happening (material context). The poverty levels of many community members impede them from properly addressing any health issue they may face:

We cannot have good health care […] as much as there is poverty, because poverty is the root cause of all these problems we are experiencing. (VDC member)

What community members need is free treatments. (community member)

Moreover, lack of funding or adequate economic resources makes it impossible to finance and guarantee any possible amelioration of the healthcare provision:

It's just the issue of funds […] because everything has to be improved with money. (VDC member)

A possible way forward to overcome such challenges was again identified in community involvement and empowerment to obtain changes at symbolic (sensitisation campaigns to tackle social constructs such as choosing traditional herbalists over hospitals or refusal to vaccinate the children) and material (donations, collective funding) levels:

The community members give contribution monthly for the improvement of the entire community and this what they are contributing to improving health services. (VDC member)

Community members can also have strong relational leverage with local governments when advocating for changes, as their requests are perceived as necessary since they are the recipients of care:

We can communicate but the community communication is bigger and better than our own […] When they carry matters or problem to higher authority the people of the high table will look into the community they will realize that this problem really exist or this thing is really needed in the facility because those people are from the facility catchment area and also whatever they complain of, even the government will look into it because they know it's a serious issue. (PHC head).

From challenges to solutions: building trusting relationships between community and healthcare providers supports child health

Building a good relationship between community and facility members is considered fundamental to strengthen the care cycle, an aspect that can tackle changes at both relational and symbolic levels. Community trust towards the healthcare providers is recognised by participants as the basis of care-seeking:

If there is no trust, they will not come. (PHC head)

Healthcare providers themselves, though, are aware of a tendency of community members to avoid hospitals:

People don't like to come to the hospital unless the condition is serious and people will not come to hospital because of preventive care. (PHC head)

Some will take their children to the hospital for treatment only when the illness has eaten up the child. (VDC member)

The inconsistent point of perceptions and norms (symbolic context) of community members on their relationship with healthcare providers is exemplified by how doctors are mentioned among the local stakeholders on child health. Some listed them among the most important stakeholders—with several participants even reporting them as more important than the child's fathers, while others ranked them as less important than the neighbours—as they are the first to assist the mothers and do not have economic interest in helping them. These conflicting reports, combined with the tendency to avoid hospitals in favour of traditional remedies, indirectly provide information on the level of trust towards healthcare providers:

The next actor is the doctor in the hospital because they are responsible for treating the child and prescribing drugs that would save the child's life […] they care for a child more than the father or even before the father of the child comes. (community member)

Neighbour is an important stakeholder before a doctor in the child's health because most of the time before you get to the hospital you need support from the neighbourhood because doctors will not attend to a person without payment. (community member)

Before they will think of coming to the hospital, they prefer giving herbs to their children. (VDC member)

Both community and facility members of Kiyawa reported the importance of having a relationship of trust, something that has communication at its basis:

We have trust. When we have problem, we directly call or we go to the community and sit down with them and talk to them what we need and then what they need then we discuss, we will finalize it with them. And then we may even tell them, if you have problem instead to sit aside, just come directly to us so that the issue will be finalize and there will be no problem. […] They have trust in us, and then we have trust in them again. (PHC head)

All participants agreed that the key to maintain and build on such relationship is intermediary bodies such as development committees, which guarantee smooth

communication between the two parties, and are involved in problem-solving processes (symbolic context):

> If the community has a problem with any of the (hospital) staff, they will contact the chairman of the Ward Development Committee, because he is a known person to everyone. (PHC head)

> To improve the perception of the people on how things are been done in the facility. For instance, some people usually come to the health facility thinking that anytime the health workers say some medicines are finished may be they don't just want to give them, so we as a committee are working together to let the people know that this drugs are brought monthly and due to the population, it may be finished before time. (VDC member)

> They [development committees] work well because people are always cooperating with this committee. (community member)

Key actors for enabling community participation: development groups foster community mobilisation and improve child health

Development committees are present in the whole LGA, supporting local communities in every aspect of life (health, education, religion, infrastructures). There are ward development committees (focusing on the bigger ward area), VDCs (centred on local communities) and various other groups that are identified as development committees, from school committees to youth associations. Their members can be anyone from local communities, and such committees work well with the community, as they are part of it themselves:

> People are always cooperating with this committee […] they work because the people in the VDC are people from the community. (community member)

Regardless of the specific focus of each group, participants reported that their goal is to play a facilitator role to improve the livelihoods of the community. They aim to improve community participation in health, create a connection with facility staff and increase trust in the local health centres working on symbolic and material contexts (from health education campaigns to increase immunisation rates, to provision of equipment and transportation means to the local health facility):

> The main aim is to strategize a way for the community people to feel comfortable and get good treatment from the facility in our community. (VDC member)

Suggestions to improve the role of VDCs are to focus more on the relational context. VDCs should facilitate community leadership by strengthening their advocacy role for health matters with state/local government, and by consolidating their position in relation to facility members as rightful decision-makers for child health:

> There is a good relationship between the community and health services but to make it better is to continue

advising the health providers on what's right even though sometimes they see our advice as a threat or disturbance. (VDC member)

Quantitative results

These results map the community relational dynamics and the relationship between them and respondents' individual characteristics. We framed the answers within the symbolic, material and relational contexts of Campbell and Cornish's framework to understand the potential influence of the different categories of participants in shaping community mobilisation.

Participants' characteristics

Overall, 1803 eligible heads of compound and 1661 women were included in the survey (table 1). While most compound heads were farmers (55.3%), 47.9% of women classified themselves as small business owners. Less than 10% of compound heads held traditional roles, of which 4.2% had a political, 3.6% religious, 1.6% healthcare-related focus. Very few participants reported being members of community groups (eg, community funds: 1.9% of compound heads and 0.6% of women, and women's associations/other community organisations: 5.2% of women).

Community cohesion

The seven questions on community cohesion (domain 1) investigate how the community members interact with each other, their internal relations, and issues that can be linked with Campbell and Cornish's symbolic and material contexts. A summary of the responses of domain 1 is shown in online supplemental figure 1 and online supplemental table 2. The overall score for domain 1 was 79.3% and 78.0% for compound head and women, respectively; including the negatively framed questions resulted in marginally lower scores for both compound heads and women (table 2).

To understand which community members' characteristics are associated with their sense of community cohesion, we ran a linear regression. From the adjusted linear regression (table 3), compound heads and women who were members of a community health fund (ie, microfinancing groups), compared with compound heads and women who were not members of such, on average, rated community cohesion, respectively, 1.87 and 1.97 points higher (compound heads=1.87 (95% CI: 0.93, 2.80), $p<0.001$; women=1.97 (95% CI: 0.37, 3.57), p=0.016). Compound head manual labourers issued scores that were on average 1.07 points higher (95% CI: 0.71 to 1.42, $p<0.001$) on domain 1 compared with farmers (table 3). For women, small business owners (−1.10 (95% CI: −1.70 to −0.50), $p<0.001$) and those not working (−1.84 (95% CI: −2.54 to −1.14), $p<0.001$) issued lower community cohesion domain scores than farmers, and women having either informal/religious (−1.14 (95% CI: −1.44 to −0.84), $p<0.001$) or formal (−0.60 (95% CI: −1.04 to

Table 2 Summary scores for each indicator (survey question)

Indicator (survey question)	Compound head N=1803			Woman N=1661		
	Mean score*	SD	%†	Mean score*	SD	%†
Domain 1 community cohesion						
Overall	5.4	3.6	69.1	5.0	3.2	67.8
Overall (adjusted)‡	5.9	2.8	79.3	5.6	2.7	78.0
1.1 Help neighbours in need	1.39	0.65	84.83	1.33	0.65	83.32
1.2 Debts repayment	1.12	0.76	77.88	1.09	0.73	77.15
1.3 Disputes are rare	1.10	0.75	77.55	1.03	0.75	75.77
1.4 NOT helping each other	0.28	1.32	43.04	0.33	1.22	41.74
1.5 NOT trusting each other	0.24	1.35	43.90	0.30	1.24	42.63
1.6 Strong relationships between people	1.14	0.75	78.42	1.10	0.74	77.38
1.7 Ability to discuss problems	1.14	0.76	78.56	1.10	0.79	77.33
Domain 2 community efficacy						
Overall	6.0	3.0	80.2	5.8	3.0	79.2
2.1 Solve a problem together	1.38	0.64	84.55	1.34	0.65	83.59
2.2 Joint efforts to finish a project	1.18	0.66	79.59	1.15	0.66	78.81
2.3 Confidence in problem-solving capacity	1.20	0.74	79.98	1.14	0.77	78.55
2.4 Ability to address problems due to sharing the same collective goal	1.10	0.76	77.57	1.08	0.74	77.03
2.5 Solutions to problems if working together	1.17	0.81	79.16	1.13	0.81	78.15
Domain 3 community leadership						
Overall	10.4	5.7	82.6	10.1	5.8	81.6
3.1 Encouraging communication	1.39	0.97	84.80	1.35	0.99	83.76
3.2 Encouraging participation in community meetings	1.39	0.79	84.65	1.34	0.80	83.41
3.3 Setting goals for the community	1.35	0.91	83.86	1.30	0.93	82.57
3.4 Developing a plan for the community	1.26	0.99	81.54	1.21	1.01	80.22
3.5 Assigning tasks fairly	1.26	1.04	81.61	1.22	1.04	80.49
3.6 Ensuring equal benefits for everyone	1.29	0.87	82.29	1.27	0.87	81.65
3.7 Obtaining external funding for community activities	1.01	1.18	75.46	1.01	1.15	75.23
3.8 Reconciling disputes	1.45	0.78	86.33	1.42	0.79	85.40

*Minimum/maximum possible scores for all questions: −2/2.
†Calculated as percentage of maximum possible score on a scale from the minimum possible score (0%) to the maximum possible score (100%).
‡Questions 1.4 and 1.5 excluded.

−0.15), p=0.009) education scored community cohesion lower than those without education.

Community efficacy

Five questions were asked on community efficacy in solving problems together, resonating with our framework's relational and symbolic contexts, and the answers are illustrated in online supplemental figure 2. Total domain 2 mean score is 80.2% for compound heads and 79.2% for women (table 2).

Among the factors that affected the replies, membership in community funds, compared with non-membership (compound heads=1.36 (95% CI: 0.39, 2.33), p=0.006; women=2.51 (95% CI: 0.81, 4.20), p=0.004) and all higher wealth quintiles compared with the lowest, as per community cohesion, had significantly higher community efficacy scores (table 3). Having received either informal/religious or formal education, compared with

no education at all, issued significantly lower scores with domain 2 for both groups of participants.

Comparing compound heads who held a religious traditional role in the community with counterparts who did not, then, our analysis found that the former, on average, tended to issue scores for community efficacy that were 0.97 points lower (95% CI: −1.69 to −0.25, p=0.008). Conversely, compound heads who were manual labourers, compared with those who were farmers, tended to issue scores for community efficacy that were, on average, 1.39 points higher (95% CI: 1.02, 1.76, p<0.001). Women issued lower domain 2 scores when being small business owners (−0.76 (95% CI: −1.40 to −0.13), p=0.018) or not working (−1.80 (95% CI: −2.54 to −1.06), p<0.001).

Community leadership

Online supplemental figure 3 summarises the answers to the eight statements on relationship and perceptions

Table 3 Adjusted linear regressions of each domain score and respondent characteristics

Respondent characteristic: variable category	Coefficient (=change in domain score) (95% CI), p value*					
	Domain 1a: community cohesion adjusted		Domain 2: community efficacy		Domain 3: community leadership	
	Compound head	Woman	Compound head	Woman	Compound head	Woman
Adjusted models (all variables modelled together)						
Age groups						
16–19		Ref (0)		Ref (0)		Ref (0)
20–29	Ref (0)	0.28 (−0.27, 0.83), p=0.317	Ref (0)	0.19 (−0.39, 0.77), p=0.527	Ref (0)	0.60 (−0.58, 1.77), p=0.318
30–39	0.10 (−1.11, 0.92), p=0.848	0.10 (−0.46, 0.66), p=0.726	0.13 (−1.18, 0.92), p=0.812	0.08 (−0.51, 0.67), p=0.781	1.95 (−0.07, 3.98), p=0.059	1.09 (−0.10, 2.29), p=0.073
40–49	0.32 (−1.31, 0.66), p=0.522	0.25 (−0.91, 0.41), p=0.461	0.16 (−1.19, 0.87), p=0.764	0.14 (−0.56, 0.84), p=0.696	1.65 (−0.31, 3.61), p=0.099	0.49 (−0.92, 1.91), p=0.493
50–59	0.33 (−1.33, 0.67), p=0.522		0.16 (−1.19, 0.87), p=0.762-		**2.01 (0.02, 4.00), p=0.048**	
60–69	1.01 (−2.04, 0.02), p=0.054		0.87 (−1.93, 0.20), p=0.111		0.62 (−1.43, 2.67), p=0.555	
70+	0.10 (−0.98, 1.19), p=0.852		0.34 (−1.46, 0.78), p=0.549		0.57 (−1.59, 2.73), p=0.605	
Main occupation						
Farmer	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)
Manual labour	**1.07 (0.71, 1.42), p=0.000**	**1.10 (−1.70 to −0.50, p=0.000**	**1.39 (1.02, 1.76), p=0.000**	0.01 (−0.64, 0.64), p=0.997	**3.04 (2.33, 3.75), p=0.000**	0.35 (−0.95, 1.65), p=0.597
Small business owner	0.33 (−0.73, 0.08), p=0.113	0.05 (−0.66, 0.56), p=0.865	0.06 (−0.47, 0.36), p=0.788	**0.76 (−1.40 to −0.13), p=0.018**	**0.90 (0.10, 1.70), p=0.028**	0.84 (−0.44, 2.11), p=0.200
Traditional role/Imam/professional	0.38 (−0.15, 0.90), p=0.161	0.21 (−2.86, 2.45), p=0.878	0.44 (−0.10, 0.99), p=0.110	1.77 (−4.57, 1.04), p=0.217	**2.21 (1.16, 3.26), p=0.000**	0.72 (−6.39, 4.96), p=0.804
Not working	0.35 (−0.97, 0.28), p=0.278	**1.84 (−2.54 to −1.14), p=0.000**	0.55 (−1.20, 0.10), p=0.095	**1.80 (−2.54 to −1.06), p=0.000**	0.53 (−1.78, 0.72), p=0.405	0.05 (−1.55, 1.44), p=0.945
Education level						
No education	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)
Informal/religious education	0.13 (−0.51, 0.25), p=0.500	**1.14 (−1.44 to −0.84, p=0.000**	**0.83 (−1.22 to −0.44), p=0.000**	**1.93 (−2.24 to −1.61), p=0.000**	0.12 (−0.63, 0.87), p=0.759	0.04 (−0.68, 0.61), p=0.911
Formal education	0.44 (−0.91, 0.28), p=0.065	**0.60 (−1.04 to −0.15), p=0.009**	**0.72 (−1.21 to −0.24), p=0.004**	**0.63 (−1.10 to −0.15), p=0.009**	0.10 (−1.03, 0.84), p=0.837	**1.01 (0.06, 1.97), p=0.037**
Traditional role in the community						

Table 3 Continued

Respondent characteristic: variable category	Coefficient (=change in domain score) (95% CI), p value*					
	Domain 1a: community cohesion adjusted		Domain 2: community efficacy		Domain 3: community leadership	
	Compound head	Woman	Compound head	Woman	Compound head	Woman
None	Ref (0)		Ref (0)		Ref (0)	
Political	0.24 (0.40, 0.88), p=461		0.17 (−0.50, 0.83), p=0.616		0.33 (−1.60, 0.94), p=0.610	
Healthcare	0.53 (−0.50, 1.57), p=310		0.81 (−0.26, 1.88), p=0.138		1.42 (−0.63, 3.48), p=0.174	
Religious	0.26 (−0.96, 0.44), p=462		**0.97 (−1.69 to −0.25), p=0.008**		0.78 (−2.16, 0.61), p=0.272	
Socioeconomic status						
Lowest	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)
Low/middle	**0.80 (0.42, 1.19), p=0.000**	**0.77 (0.38, 1.16), p=0.000**	**1.38 (0.98, 1.78), p=0.000**	**1.14 (0.73, 1.55), p=0.000**	**2.74 (1.98, 3.51), p=0.000**	**2.74 (1.91, 3.57), p=0.000**
Middle	**0.63 (0.23, 1.03), p=0.002**	**0.79 (0.38, 1.19), p=0.000**	**0.90 (0.48, 1.31), p=0.000**	**1.04 (0.61, 1.47), p=0.000**	**1.45 (0.65, 2.25), p=0.000**	**1.96 (1.10, 2.83), p=0.000**
Middle/high	**0.95 (0.54, 1.36), p=0.000**	**1.08 (0.68, 1.49), p=0.000**	**1.19 (0.76, 1.61), p=0.000**	**1.25 (0.82, 1.68), p=0.000**	**3.06 (2.24, 3.87), p=0.000**	**3.41 (2.54, 4.27), p=0.000**
Highest	**1.23 (0.79, 1.66), p=0.000**	**1.19 (0.76, 1.62), p=0.000**	**1.67 (1.22, 2.12), p=0.000**	**1.41 (0.96, 1.87), p=0.000**	**3.12 (2.26, 3.99), p=0.000**	**3.35 (2.44, 4.27), p=0.000**
Community funds membership						
No	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)	Ref (0)
Yes	**1.87 (0.93, 2.80), p=0.000**	**1.97 (0.37, 3.57), p=0.016**	**1.36 (0.39, 2.33), p=0.006**	**2.51 (0.81, 4.20), p=0.004**	**1.93 (0.07, 3.80), p=0.042**	**5.03 (1.60, 8.45), p=0.004**
Membership in the women's association or other community organisations						
No		Ref (0)		Ref (0)		Ref (0)
Yes		0.31 (−0.89, 0.27), p=0.299		0.14 (−0.48, 0.75), p=0.665		**1.94 (−3.19 to −0.69), p=0.002**

*p values <0.05 are highlighted in bold.

on community leaders—investigating the relational and material contexts. As shown in table 2, the domain mean scores are 82.6% for compound heads and 81.6% for women. The only indicator score below 80% is the ability to obtain external funding for community activities.

Regression analysis (table 3) shows that, consistently with the other two domains, both compound heads and women who were members of community funds and had higher socioeconomic status (compared with the poorest ones) had higher scores with these questions.

Among compound heads, those aged 50–59 years, when compared with those aged 20–29 years, on average, reported community leadership scores that were approximately 2.01 points higher (95% CI: 0.02, 4.00, p=0.048), as did those who are manual labourers, small business owners, or who hold a professional/traditional role compared with those who are farmers. Among women, those with formal education, compared with the ones who received no education at all, on average, issued scores for domain 3 that were 1.01 points higher (95% CI: 0.06, 1.97, p=0.037). Female members of a women's association issued scores 1.94 lower (95% CI: −3.19 to −0.69, p=0.002) than women not affiliated with any group.

Community collective action

The most common response from women on how they would solve a community issue (exploring the symbolic and relational contexts) was to approach their husbands (81%). Only 1% said they would avoid acting or approach health facility staff, and the rest would seek help from other family and community members (figure 1). The most common response of compound heads was to approach family members or other men/women in the community (59%). The second favourite option was 'deal with it myself' (25%), followed by 'approach local leaders' (11%). Only 3% would approach facility staff, while 1% would not act at all.

The results indicate that certain characteristics of the participants are statistically significantly associated with their responses regarding community collective actions. Specifically, the type of main occupation, education level and socioeconomic status showed significant associations with answers provided by both compound heads and women (see online supplemental table 2). In the case of compound heads, their responses showed connections with factors like age groups, holding a traditional role in the community and being a member of community funds. For women, membership in the women's association showed a statistically significant association with their answers.

DISCUSSION

In this study, we explored community perceptions of what could make a prospective PLA and community–facility linkage intervention work to achieve its potential to improve the health, healthcare access and quality of care for under-5 children. Using Campbell and Cornish's framework,[28] we identified contextual factors and changes that the future intervention needs in order to obtain strong community participation to improve child health in the specific context of Jigawa. From this analysis, we observed the equal importance of community members' health education and awareness of health rights for good quality of care, and active participation in
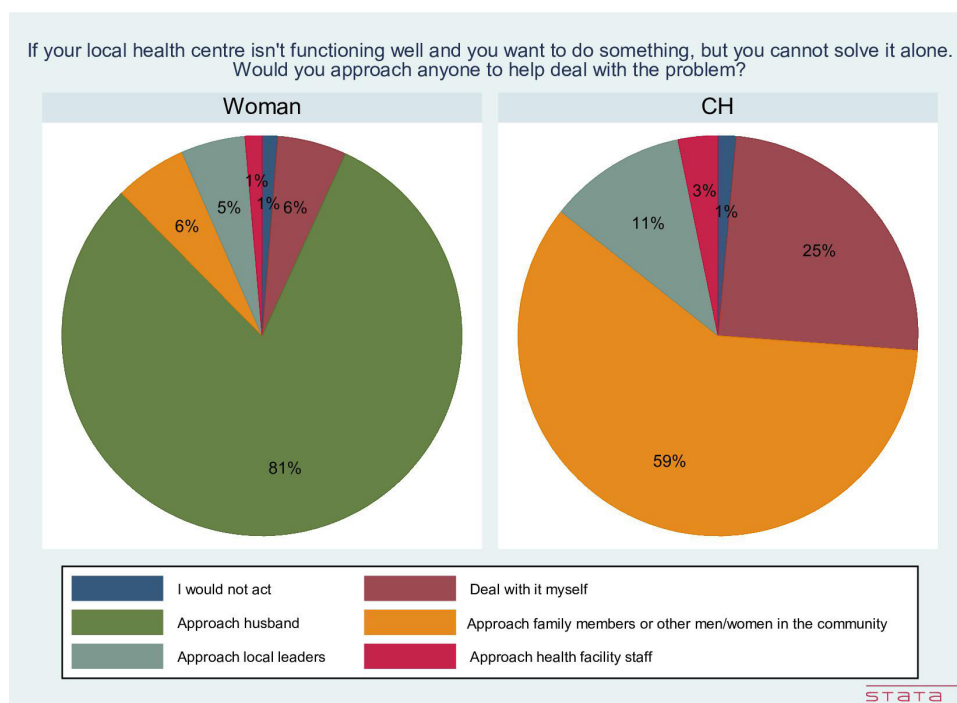
Figure 1 Percentage answers on community collective action by compound head (CH) or woman.
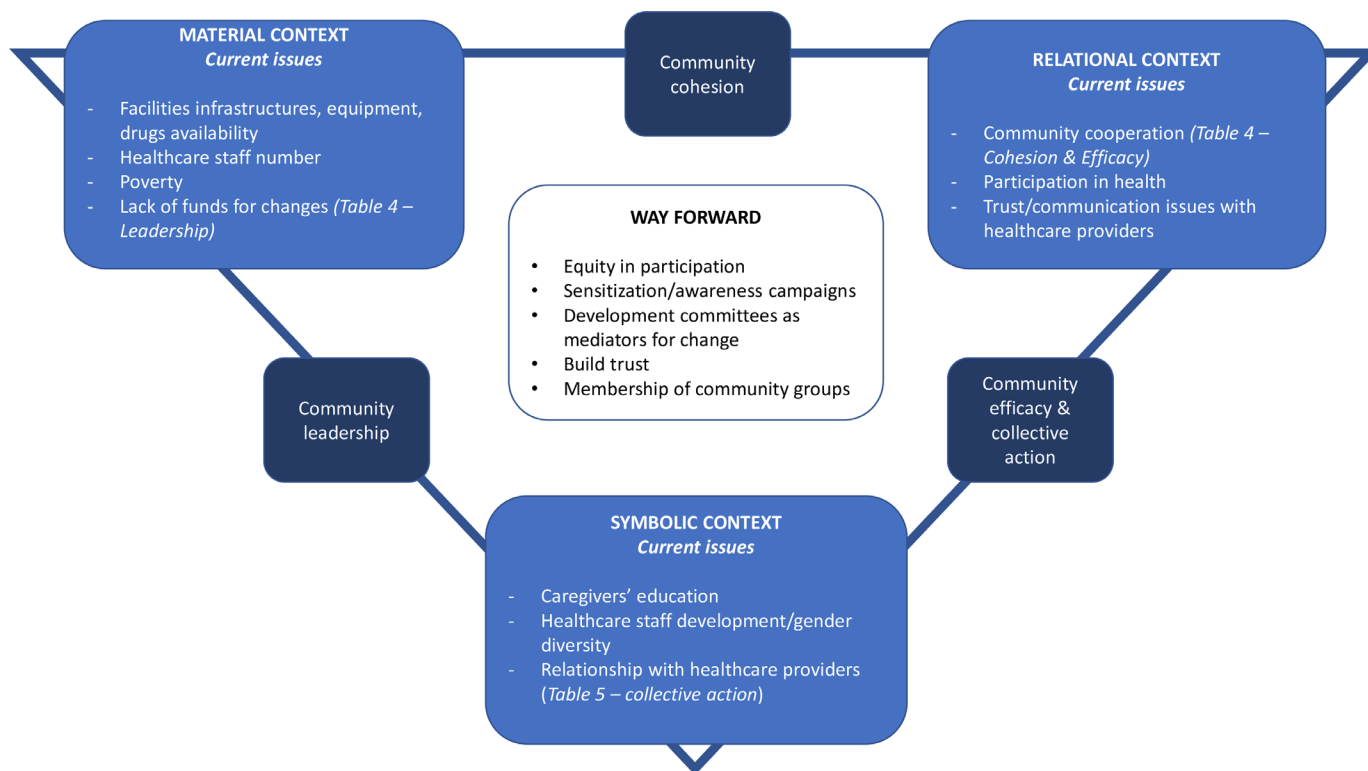
Figure 2 Derived framework identifying key features for a prospective community participatory intervention for child health.

health decisions, trust and cooperation with healthcare providers. A clear pathway for facilitating this trust was development committees, with participation in community associations helping to strengthen community capacity. Figure 2 summarises these key points emerging from the analysis and graphically represents the locally informed framework that we built to inform the design of the intervention, adapting Campbell and Cornish's theory to the results of local knowledge about participation and perceptions around internal relations' dynamics. The framework presents the current issues—as emerged from the data analysis categorised under the three contexts of Campbell and Cornish—on the sides, and at the centre the way forward, summarising the key recommendations to build a participatory intervention.

Figure 2 summarises some issues pertinent to the community's relationships and indicates points to focus on as a way forward. The qualitative data highlighted the importance of a united community, capable of facing the adversities together, aware of their rights and able to bring improvements based on their needs. The quantitative information indicated that there are opportunities to leverage community characteristics in ways that can help optimise a community empowerment intervention, with community members generally having positive beliefs towards their cohesion and problem-solving efficacy. A community that has a strong sense of cohesion and tends to work together in case of need is ready, with the right help, to become bearer of change and long-lasting improvement. The quantitative results, though, also showed that this sense of cohesion was not universal, with

groups like traditional and religious leaders or female small business owners/not working having lower scores with such questions. This is a reminder that interventions focused on communities always need attentive plans to be as comprehensive as possible and address axes of inequality in a manner that is contextually appropriate—one of the points to focus on as a way forward (figure 2). Some categories of community members, not starting from the same point or feeling towards their peers, might end up being excluded—as reported by similar studies.[46–48]

Other factors flagged by our analysis and presented in figure 2 are linked to trust and the relationship between community members and healthcare providers. The answers to the community collective action question, in fact, pointed to sociocultural norms present in these communities: to solve problems, even when related to the local health centre, community members would rather rely on themselves or on family members (husbands for women) than on health facility staff. Such cultural factors need to be taken into account in future interventions aiming at connecting communities and healthcare providers. Furthermore, the mixed opinions in the qualitative data on the relationship between community members and healthcare providers and the reported avoidance of health centres unless under extreme circumstances speak to the evidence found in the literature on low levels of trust towards healthcare providers and health facilities in contexts like Jigawa.[47 49 50] This nodal point confirms the need for an intervention aimed at strengthening such community–healthcare provider relationship,

as something that has the potential to change not only the symbolic context (by increasing trust towards doctors) but also the relational one (a strong relationship can increase decision-making and a sense of ownership of health).

For material context, the spotlight was on structural and logistical issues (figure 2). Here, development groups stand out as vital to mediate changes and foster improvements. Their role is mediating between the local people and the health providers, and they were seen with a great level of trust (being part of the community themselves but in charge of communicating with the facilities) from both sides. Unsurprisingly, all the quantitative domain scores were consistently significantly higher if the participants were members of community funds, suggesting that, when already part of established groups, community members are more likely to have positive feelings towards community engagement and the possibilities of a community participatory intervention. Even if the cross-sectional nature of the data prevents us from determining the direction of influences, such as whether more positive feelings cause community members to join groups or vice versa, these findings still suggest that community groups can serve as a valuable intermediary tool for a community–facility linkage intervention and have the potential to be the right vessel to bring contextual changes at all levels.

Therefore, this framework (figure 2) and its recommendations serve the purpose of guiding the design of the participatory intervention. However, it will have a dual role, also informing the evaluation of the intervention at a later stage. We will use it to evaluate the implementation's fidelity in addressing the identified focal points and how the recommendations derived from this analysis were incorporated in determining the intervention's course of action.

The whole study methodology and building this framework have been focused on tailoring the implementation to its setting. This has allowed us to gain a deep understanding of Jigawa's specific context in ways that we could not have anticipated a priori, which is something that all participatory implementations should aim to have. Even if it will not be possible to use our framework for different projects, we believe that the adaptation process we followed to build it (inclusion of the prospective participants' voices from the formative phase and focus on understanding the context) can be replicated in future studies.

We had a few key limitations. First, we excluded the two negatively framed questions from the community cohesion domain in the primary analysis, as those answers were contrasting with all the other ones. This could be due to the fact that respondents may have misinterpreted these questions given the negative framing (different to the positive framing of all the other questions),[51 52] or it could confirm a common bias of Likert-type answers, being that the respondents tend to consistently choose the same answers, de facto devaluating this type of data.[53] In this case, the former is more likely as the percentage of the answers to the negative questions was not similar compared with all the other ones, suggesting responses were not automatic or consistently the same. Additionally, given the mixed methodology and our triangulation, we could substantiate that the general positive answers given in the questionnaire were reflective of the actual feelings of the respondents shared during CC sessions. The second limitation was given by the cross-sectional nature of the quantitative data, which makes it impossible to determine the direction of influences in the relationship between participant characteristics and the outcomes. However, using mixed methods allowed us to overcome this issue, triangulating the results to give more meaning to the statistical associations. Finally, another limitation was the small sample for exploring some of the associations, and the multiple hypothesis testing (though many p values were very low, that is, p=0.000, indicative of highly statistically significant results even in the context of multiple tests). Some statistical associations were calculated using X^2 test, where a Fisher's exact test would have been more appropriate, but we were unable to calculate p values using that methodology. The variables in need of such test, though, were very few, and we considered X^2 test as a valid substitute in this instance.

CONCLUSION

A community participatory intervention has a lot of potential to improve child health in this context of rural Jigawa State, Nigeria. A community health education component will be necessary, as much as the involvement and inclusion on health matters of community members regardless of their role in the community, aiming at engaging local people at any level. Strengthening the relationships between local healthcare providers and community members emerged as a key point to increase trust and healthcare attendance for future implementations. The presence of intermediary structures like VDCs or organisations such as community fund groups creates a stronger sense of trust towards the possibilities of success of a community–facility linkage intervention, and so should be established or leveraged to serve as a bridge between the villages and the health facilities.

The process we followed of adapting existing theory into a contextually appropriate intervention by eliciting local knowledge will hopefully lead to successful results and improvements in quality of care for under-5 children and inspire future studies to follow a similar methodology when designing participatory interventions.

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REFERENCES

1. Burns D, Heywood F. *Making community participation meaningful: a handbook for development and assessment*. Policy Press, 2004.
2. Ndekha A, Hansen EH, Mølgaard P, *et al*. Community participation as an interactive learning process: experiences from a Schistosomiasis control project in Zimbabwe. *Acta Trop* 2003;85:325–38.
3. Haldane V, Chuah FLH, Srivastava A, *et al*. Community participation in health services development, implementation, and evaluation: a systematic review of empowerment, health, community, and process outcomes. *PLoS One* 2019;14:e0216112.
4. World Health Organization. *Patient engagement: technical series on safer primary care*. Geneva: World Health Organization, 2016.
5. De Vos P, De Ceukelaire W, Malaise G, *et al*. Health through people's empowerment: a rights-based approach to participation. *Health & Hum Rts* 2009;11:23.
6. Marston C, Hinton R, Kean S, *et al*. Community participation for transformative action on women's, children's and adolescents' health. *Bull World Health Organ* 2016;94:376–82.
7. Desai S, Misra M, Das A, *et al*. Community interventions with women's groups to improve women's and children's health in India: a mixed-methods systematic review of effects, enablers and barriers. *BMJ Glob Health* 2020;5:e003304.
8. Mubita A, Libati M, Mulonda M. The importance and limitations of participation in development projects and programmes. *ESJ* 2017;13:238. 10.19044/esj.2017.v13n5p238 Available: http://eujournal.org/index.php/esj/issue/view/266
9. White SC. Depoliticising development: the uses and abuses of participation. *Dev Pract* 1996;6:6–15.
10. Hahn DL, Hoffmann AE, Felzien M, *et al*. Tokenism in patient engagement. *FAMPRJ* 2016;34:cmw097.
11. Gruber J, Caffrey M. HIV/AIDS and community conflict in Nigeria: implications and challenges. *Soc Sci Med* 2005;60:1209–18.
12. Campbell C, Jovchelovitch S. Health, community and development: towards a social psychology of participation. *J Community Appl Soc Psychol* 2000;10:255–70.
13. Pfeiffer J. International NGOs and primary health care in Mozambique: the need for a new model of collaboration. *Soc Sci Med* 2003;56:725–38.
14. Swapan MSH. Who participates and who doesn't? Adapting community participation model for developing countries. *Cities* 2016;53:70–7.
15. Puri E. 2004 Understanding participation: theoretical foundations and practical implications. *Econ Polit Wkly*;2004:2511–7.
16. Haldane V, Chuah FLH, Srivastava A, *et al*. Community participation in health services development, implementation, and evaluation: A systematic review of empowerment, health, community, and process outcomes. *PLoS One* 2019;14:e0216112.
17. Rifkin SB. Lessons from community participation in health programmes: a review of the post Alma-ATA experience. *Int Health* 2009;1:31–6.
18. Rifkin SB. Alma ATA after 40 years: primary health care and health for all-from consensus to complexity. *BMJ Glob Health* 2018;3(Suppl 3):e001188.
19. Nastasi BK, Varjas K, Schensul SL, *et al*. The participatory intervention model: a framework for conceptualizing and promoting intervention acceptability. *Sch Psychol Q* 2000;15:207–32.
20. Jackson SF, Cleverly S, Poland B, *et al*. Working with Toronto neighbourhoods toward developing indicators of community capacity. *Health Promot Int* 2003;18:339–50.
21. Johnson DW, Johnson FP. *Joining together: group theory and group skills*. Prentice-Hall Inc, 1991.
22. Goodman RM. A construct for building the capacity of community-based initiatives in racial and ethnic communities: a qualitative cross-case analysis. *J Public Health Manag Pract* 2009;15:E1–8.
23. Blandón-Lotero LC, Jaramillo-Mejía MC. Communities on the move: community participation in health in rural territories of Buenaventura district in Colombia. *Int J Equity Health* 2020;19:129.
24. Liberato SC, Brimblecombe J, Ritchie J, *et al*. Measuring capacity building in communities: a review of the literature. *BMC Public Health* 2011;11:850.
25. Barman D, Vadrevu L. How is perceived community cohesion and membership in community groups associated with children's dietary adequacy in disadvantaged communities? A case of the Indian Sundarbans. *BMC Health Serv Res* 2016;16(Suppl 7):622.
26. Miller HN, Thornton CP, Rodney T, *et al*. Social cohesion in health: a concept analysis. *ANS Adv Nurs Sci* 2020;43:375–90.
27. Plesko CM, Yu Z, Tobin K, *et al*. Social connectedness among parents raising children in low-income communities: an integrative review. *Res Nurs Health* 2021;44:957–69.
28. Campbell C, Cornish F. Towards a "fourth generation" of approaches to HIV/AIDS management: creating contexts for effective community Mobilisation. *AIDS Care* 2010;22 Suppl 2:1569–79.
29. Freire P. *Education for critical consciousness*. New York: Seabury press, 1973.
30. Born P. *Community conversations: mobilizing the ideas, skills, and passion of community organizations, governments, businesses and people*. BPS Books, 2012.
31. Mutale W, Masoso C, Mwanza B, *et al*. Exploring community participation in project design: application of the community

conversation approach to improve maternal and newborn health in Zambia. *BMC Public Health* 2017;17:277.

32 Kotzé M, Seedat M, Suffla S, *et al*. Community conversations as community engagement: hosts' reflections. *S Afr J Psychol* 2013;43:494–505.

33 Campbell C, Nhamo M, Scott K, *et al*. The role of community conversations in facilitating local HIV competence: case study from rural Zimbabwe. *BMC Public Health* 2013;13:354.

34 King C, Burgess RA, Bakare AA, *et al*. Integrated sustainable childhood pneumonia and infectious disease reduction in Nigeria (INSPIRING) through whole system strengthening in Jigawa, Nigeria: study protocol for a cluster randomised controlled trial. *Trials* 2022;23:95.

35 Davis K, Minckas N, Bond V, *et al*. Beyond interviews and focus groups: a framework for integrating innovative qualitative methods into randomised controlled trials of complex public health interventions. *Trials* 2019;20:329.

36 Lovich R, Rubardt M, Fagan D, *et al*. *Partnership Defined Quality*. US: Save the Children, 2003.

37 Trial registration: the INSPIRING project – building capacity to reduce child deaths in Jigawa state Nigeria. 2020. Available: https://www.isrctn.com/ISRCTN39213655

38 Jigawa State Government. Jigawa state - peoples and culture. 2017. Available: http://www.jigawastate.gov.ng/people_culture.php

39 CityPopulation.de. Local government area in Nigeria. 2020. Available: https://www.citypopulation.de/php/nigeria-admin.php?adm2id=NGA018019

40 National Population Commission - NPC, ICF. *Nigeria Demographic and Health Survey 2018 - Final Report*. Abuja, Nigeria: NPC and ICF, 2019.

41 United Nations Inter-agency Group for Child Mortality Estimation (UN IGME). *Levels & Trends in Child Mortality: Report 2019, estimates developed by the United Nations inter-agency group for child mortality estimation*. New York: United Nations Children's Fund, 2019.

42 Burgess RA, Shittu F, Iuliano A, *et al*. Whose knowledge counts? Involving communities in intervention and trial design using community conversations. *Trials* 2023;24:385.

43 Shorten A, Smith J. Mixed methods research: expanding the evidence base. *Evid Based Nurs* 2017;20:74–5.

44 USAID. *Technical note: conducting mixed-method evaluations*. 2013.

45 Attride-Stirling J. Thematic networks: an analytic tool for qualitative research. *Qual Res* 2001;1:385–405.

46 Kamugisha SR, Dobson AE, Stewart AG, *et al*. A retrospective cross sectional study of the effectiveness of a project in improving infant health in Bwindi, South Western Uganda. *Front Public Health* 2018;6:290.

47 Oguntunde O, Surajo IM, Dauda DS, *et al*. Overcoming barriers to access and utilization of maternal, newborn and child health services in northern Nigeria: an evaluation of facility health committees. *BMC Health Serv Res* 2018;18:104.

48 Kushitor MK, Biney AA, Wright K, *et al*. A qualitative appraisal of Stakeholders' perspectives of a community-based primary health care program in rural Ghana. *BMC Health Serv Res* 2019;19:675.

49 Koce F, Randhawa G, Ochieng B. Understanding healthcare self-referral in Nigeria from the service users' perspective: a qualitative study of Niger state. *BMC Health Serv Res* 2019;19:209.

50 Abubakar I, Dalglish SL, Angell B, *et al*. The Lancet Nigeria Commission: investing in health and the future of the nation. *Lancet* 2022;399:1155–200.

51 Cohen G, Forbes J, Garraway M. Can different patient satisfaction survey methods yield consistent results? Comparison of three surveys. *BMJ* 1996;313:841–4.

52 Kamoen N, Holleman B, Mak P, *et al*. Agree or disagree? Cognitive processes in answering contrastive survey questions. *Discourse Processes* 2011;48:355–85.

53 Subedi BP. Using Likert type data in social science research: confusion, issues and challenges. *Int J Contemp Appl Sci* 2016;3:36–49.
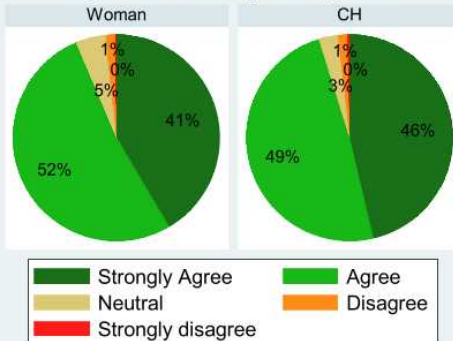
Supplementary Table 1. Community Conversations activities

CC Activities	Participants	Topics
Body Mapping	▪ Community members (women's* and men's groups)	• Health risks for local children
Venn Diagram	▪ Community members (women's* and men's groups)	• Identification of local stakeholders • Analysis of relationships in the community • Stakeholders' influence in children's health issues
Community Mapping	▪ Community members (women's* and men's groups)	• Spatial organization of the local community
Focus Group Discussion	▪ Community members (women's* and men's groups) ▪ Village Development Committee members ▪ PHC healthcare providers	• Quality of care, challenges/facilitating factors of good delivery • Relationship between community and facility members • Identification of the right features for an intervention to improve health

* Split in 2 subgroups (older/younger women)

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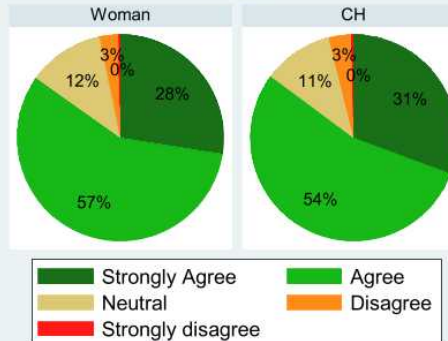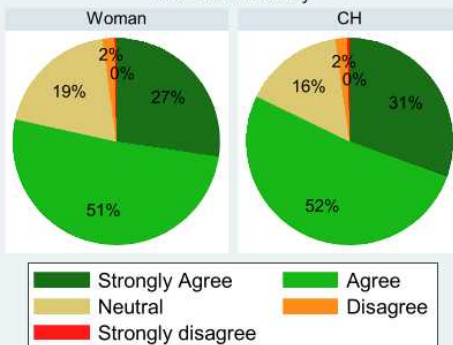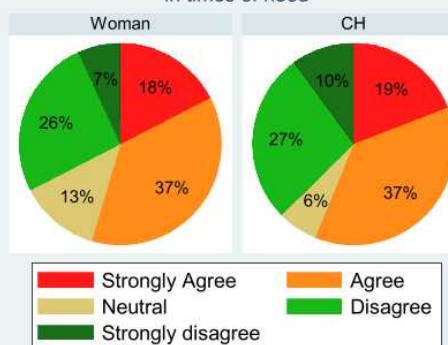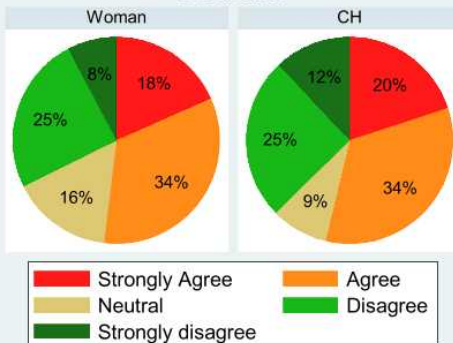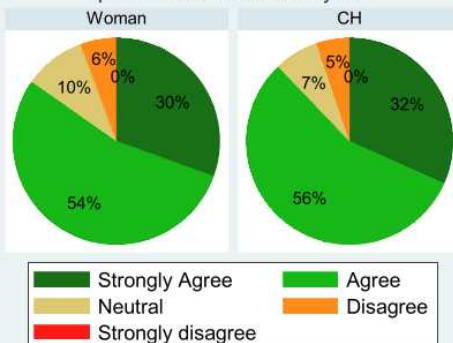
Supplementary Table 2. Associations with Community Collective Actions

|	I would not act N (%)	Deal with it myself N (%)	Approach family members or other community men/women N (%)	Approach local leaders N (%)	Approach health facility staff N (%)		I would not act N (%)	Deal with it myself N (%)	Approach husband N (%)	Approach family members or other community men/women N (%)	Approach local leaders N (%)	Approach health facility staff N (%)	
	Compound Head						**Woman**						
Total N(%)	26(1.4%)	446(24.7%)	1,072(59.5%)	201(11.2%)	58(3.2%)		20(1.2%)	94(5.7%)	1,339(80.6%)	98(5.9%)	87(5.2%)	23(1.4%)	
Age groups													
16-19							2(2.0%)	3(3.0%)	79(79.0%)	6(6.0%)	7(7.0%)	3(3.0%)	
20-29	0	12(38.7%)	14(45.2%)	2(6.5%)	3(9.7%)		7(0.9%)	48(6.2%)	627(80.3%)	44(5.6%)	44(5.6%)	11(1.4%)	
30-39	7(2.6%)	71(26.0%)	149(54.6%)	34(12.5%)	12(4.4%)		11(1.8%)	37(6.0%)	504(81.3%)	30(4.8%)	32(5.2%)	6(1.0%)	
40-49	13(1.8%)	193(26.8%)	423(58.8%)	72(10.0%)	19(2.6%)		0	6(3.8%)	129(80.6%)	18(11.3%)	4(2.5%)	3(1.9%)	
50-59	3(0.7%)	111(26.7%)	268(64.4%)	26(6.3%)	8(1.9%)								
60-69	3(1.3%)	28(11.8%)	156(65.8%)	40(16.9%)	10(4.2%)								
70+	0	31(24.6%)	62(49.2%)	27(21.4%)	6(4.8%)								
					p=0.000							p=0.092	

Main occupation

Farmer	10(1.0%)	174(17.5%)	615(61.7%)	152(15.3%)	46(4.6%)		0	13(15.5%)	68(81.0%)	2(2.4%)	0	1(1.2%)
Manual labour	8(2.4%)	168(50.6%)	136(41.0%)	13(3.9%)	7(2.1%)		7(1.2%)	24(4.1%)	453(76.5%)	38(6.4%)	55(9.3%)	15(2.5%)
Small business owner	4(1.7%)	37(15.4%)	176(73.3%)	22(9.2%)	1(0.4%)		10(1.3%)	53(6.7%)	653(82.5%)	46(5.8%)	24(3.0%)	6(0.8%)
Traditional/Imam/ Professional	4(2.8%)	54(37.5%)	70(48.6%)	12(8.3%)	4(2.8%)		0	1(25.0%)	2(50.0%)	0	1(25.0%)	0
Not working	0	13(14.4%)	75(83.3%)	2(2.2%)	0		3(1.6%)	3(1.6%)	163(86.2%)	12(6.4%)	7(3.7%)	1(0.5%)
						p=0.000						p=0.000

Education level

No education	7(2.4%)	43(14.6%)	219(74.5%)	16(5.4%)	9(3.1%)		9(1.7%)	29(5.5%)	454(85.7%)	23(4.3%)	1(0.2%)	14(2.6%)
Informal/ religious	11(1.0%)	326(28.2%)	623(53.9%)	154(13.3%)	43(3.7%)		5(0.6%)	45(5.0%)	710(78.0%)	60(6.6%)	81(8.9%)	9(1.0%)
Formal	8(2.3%)	77(21.9%)	230(65.3%)	31(8.8%)	6(1.7%)		6(2.7%)	20(9.1%)	175(79.2%)	15(6.8%)	5(2.3%)	0
						p=0.000						p=0.000

Traditional role in the community

None	26(1.6%)	394(24.1%)	985(60.2%)	175(10.7%)	55(3.4%)	
Political	0	17(22.7%)	48(64.0%)	8(10.7%)	2(2.7%)	
Healthcare	0	17(60.7%)	11(39.3%)	0	0	
Religious	0	18(27.7%)	28(43.1%)	18(27.7%)	1(1.5%)	
						p=0.000

| Socio-economic status												
Lowest	3(0.8%)	90(23.9%)	244(64.7%)	34(9.0%)	6(1.6%)		5(1.4%)	20(5.6%)	273(76.9%)	27(7.6%)	27(7.6%)	3(0.9%)
Low/Middle	5(1.3%)	86(21.9%)	212(54.1%)	73(18.6%)	16(4.1%)		2(0.6%)	15(4.1%)	321(87.7%)	11(3.0%)	10(2.7%)	7(1.9%)
Middle	1(0.3%)	103(30.3%)	204(60.0%)	18(5.3%)	14(4.1%)		3(1.0%)	20(6.6%)	250(82.0%)	16(5.3%)	11(3.6%)	5(1.6%)
Middle/High	5(1.5%)	79(23.5%)	204(60.7%)	39(11.6%)	9(2.7%)		3(1.0%)	14(4.5%)	256(82.6%)	11(3.6%)	24(7.7%)	2(0.7%)
Highest	12(3.4%)	88(24.6%)	208(58.1%)	37(10.3%)	13(3.6%)		7(2.2%)	25(7.7%)	239(73.5%)	33(10.2%)	15(4.6%)	6(1.9%)
						p=0.000						p=0.000
Community funds membership												
No	26(1.5%)	428(24.2%)	1,059(59.9%)	200(11.3%)	56(3.2%)		20(1.2%)	93(5.6%)	1,331(80.7%)	96(5.8%)	87(5.3%)	23(1.4%)
Yes	0	18(52.9%)	13(38.2%)	1(2.9%)	2(5.9%)		0	1(9.1%)	8(72.7%)	2(18.2%)	0	0
						p=0.002						p=0.547
Women's association/other comm. organizations membership												
No							20(1.3%)	91(5.8%)	1,271(80.8%)	93(5.9%)	83(5.3%)	16(1.0%)
Yes							0	3(3.5%)	68(78.2%)	5(5.8%)	4(4.6%)	7(8.1%)
												p=0.000

2.1 If a problem arise that people cannot solve by themselves, our community as a whole will be able to solve it
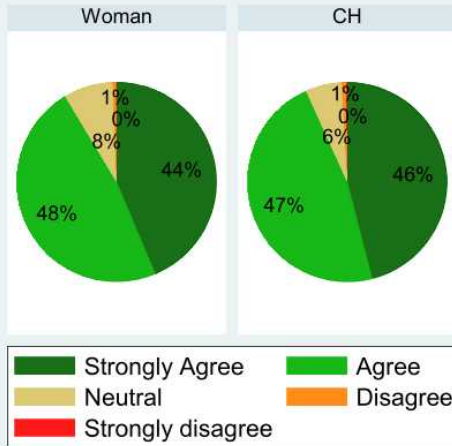
2.2 Whenever our community undertakes a project, we know that we will all work hard until it is accomplished
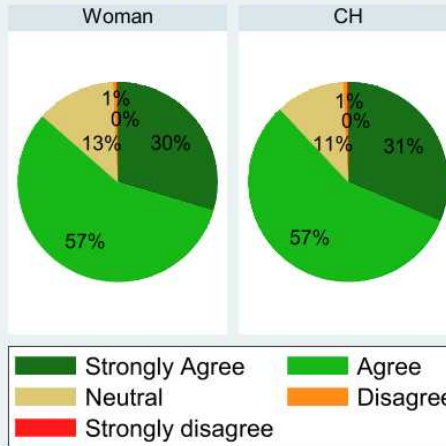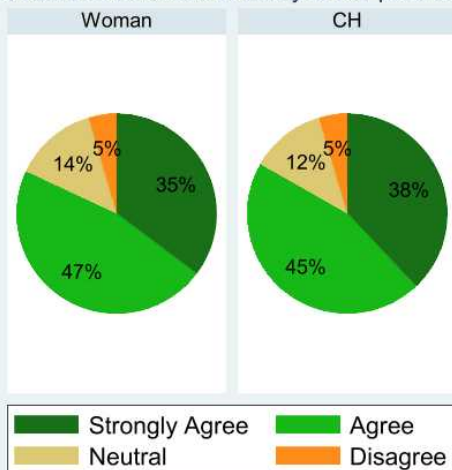
2.3 Whenever a community problem arises, I have a lot of confidence that we will be able to solve it
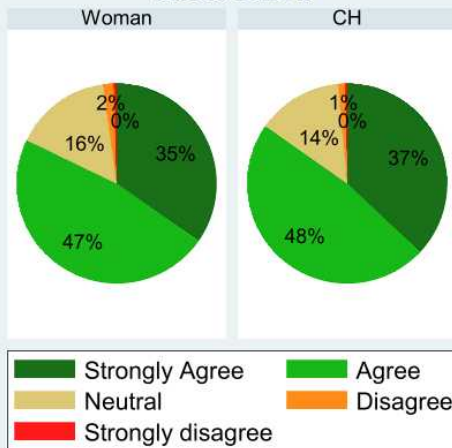
2.4 As members of this comm., we are able to tackle the most difficult situations because we are all committed to the same collective goals
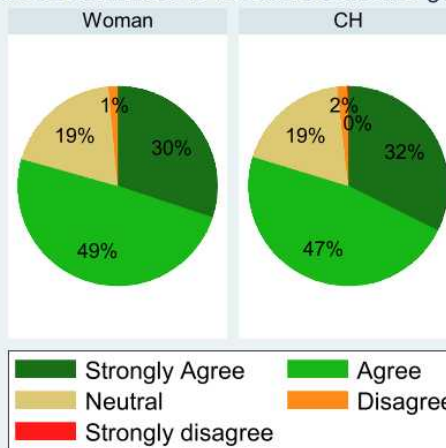
2.5 If people in this community work together, we can find solutions to many of our problems

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3.1 Getting people in the community to start talking about a problem

3.2 Encouraging people in the community to participate in community meetings

3.3 Setting goals and objectives for community activities

3.4 Developing a plan for community activities

3.5 Assigning tasks fairly

3.6 Ensuring that everyone gets the same benefits from the c. activity

3.7 Obtaining money from organizations outside the c. to support the activity

3.8 Reconciling disputes in the community