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Engage less, provide more: Community health workers' perspectives on how to overcome opposition to polio vaccination in Pakistan

Arman Majidulla[a], Marium A. Sultan[a], Ayesha Zaman[b], Muhammad Shafique[c], Saeed Ahmed[c], Farah Naz[c], Sadaf Nayyab[c] and Ali Sohail[c]

[a]Department of International Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD, USA; [b]Zaman Welfare Foundation, Lahore, Pakistan; [c]Sohail Inc, Peshawar, Pakistan

ABSTRACT

Pakistan has 40 Super High Risk Union Councils (SHRUCs) where polio has been persistently endemic, and community relationships have been a persistent challenge due to campaign fatigue and violent, organised resistance. This study aimed to gather perspectives from frontline workers in these areas to improve community engagement. We conducted participant observation, over 100 interviews, and held Human-centred Design inspired sessions with 171 teams of frontline polio staff from 2020 to 2022 in the SHRUCs of a major city in Pakistan. The results show that frontline polio workers repeatedly visited households broadly neglected by government services in SHRUCs, but some households refused the vaccine due to fatigue from multiple visits and fear of government surveillance. Others refused the vaccine to draw attention to their more pressing needs. Frontline polio workers suggested that decreasing touchpoints and providing additional services, such as food, medicines, primary health care, and sanitation services, would improve vaccine uptake. We discuss several implications for vaccine communications, including the importance of quality engagement, the legitimacy of rumours surrounding vaccination, the limited applicability of 'vaccine hesitancy', and the critical role of service provision in improving vaccine acceptability.

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Introduction

Waadiabad (*a pseudonym), Pakistan has many 'Super High Risk Union Councils' or 'SHRUCs', areas at high risk of polio cases. In all of them, female frontline workers/community health workers (FLWs/CHWs) and Social Mobilizers (SMs) regularly go door-to-door vaccinating children under five against polio. As an Area Supervisor, Hira (*not a real name) monitored teams of FLWs, compiled the data they collected, and convinced families to vaccinate.

On the hot and humid Friday morning we accompanied Hira, her task was to vaccinate children who had been unavailable earlier when the FLWs had visited earlier in the week, or whose families had refused the vaccine. We walked over small makeshift concrete bridges to reach the entrances to homes, crossing an open sewage line filled with grey pungent water. We watched children drop

CONTACT Arman Majidulla amajidu1@jhu.edu Department of International Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe St. E5039, Baltimore, MD 21295, USA

their toys into the sewer, collect and wring them out, and continue playing. Hira told us that during rains, this contaminated water also overflowed into the houses, exemplifying the infrastructural and economic challenges her area faces.

We went through a large yellow gate into a household where the parents had repeatedly refused the oral polio vaccine for their children. The mother asked us for soap, but we had no soap to give. A few months ago, as part of a COVID-19 prevention tie-in, soap was given to chronic refusal households like these. The family refused the vaccine again this visit, saying they would go to the hospital to vaccinate. Hira told the family about the health camp being held this Saturday, and then commented to us:

> I always mention the medical camp because these people can't afford medicines, and there they can get them for free. We frontline workers shouldn't only do immunizations. These people need folic acid and vitamin C. Why do we only tackle polio?

After an effort spanning more than twenty years, Pakistan, one of the last two polio-endemic countries in the world, may be on the brink of eliminating polio. Pakistan has 40 SHRUCs, sub-districts where polio has been persistently endemic. The Global Polio Eradication Initiative (GPEI) has a 'laser-focus' on these SHRUCs, which are often densely populated and underserved by a range of government services (Independent Monitoring Board of the Global Polio Eradication Initiative, 2019; Khowaja et al., 2012).

In these SHRUCs, which see many polio campaigns per year but few other government services, many parents of young children are experiencing 'campaign fatigue' (Toole, 2016). And beyond fatigue, there is also violent, organised resistance to polio campaigns. In total, at least 70 FLWs carrying out polio campaigns have been murdered in the last 10 years (Ittefaq et al., 2021), though many estimates put the figure closer to 100 (Ataullahjan et al., 2021; Closser et al., 2016; Habib et al., 2017; Neel et al., 2021; Yahya, 2007). Since 2022, at least five polio workers have been killed in Pakistan: four security escorts assigned to the polio campaign, and one female vaccinator (Independent Monitoring Board of the Global Polio Eradication Initiative, 2021; Jegede, 2007; Pakistan Polio Eradication Program, 2020). The Government of Pakistan, UNICEF and the Gates Foundation now label frontline workers as heroes for their efforts to eradicate polio amidst deep personal insecurity (Closser, 2015; Gates, 2021; The Nation, 2020; UNICEF & World Health Organization, 2012). However, long term, sustainable community relationships are needed to ensure that children receive enough doses of Oral Polio Vaccine (OPV) to confer immunity (Independent Monitoring Board of the Global Polio Eradication Initiative, 2019). Yet in these contexts, developing and maintaining these relationships has been a challenge.

Previous studies on polio vaccine refusal in Pakistan have highlighted factors such as conspiracy theories, misinformation, religious-based resistance, ethnic influences, coercion, and a lack of trust in both polio programme actors, both international and governmental, enhancing the credibility of misinformation (Abbasi et al., 2023; Ataullahjan et al., 2021; Habib et al., 2017; Ittefaq et al., 2021; Khan et al., 2020; Khowaja et al., 2012). Our study echoes these themes, while expanding on the importance of the interplay between the polio programme and the community itself – an interaction with the FLW at the centre. This work examines at close range the details of what happens on the doorstep and the dynamics that underlie them – dynamics which, FLWs argue, matter for the eradication of polio.

The Independent Monitoring Board (IMB) of the Global Polio Eradication Initiative (GPEI) posited that in 'alienated and mistrustful communities', focusing on OPV education and mobilisation alone is unlikely to increase vaccine coverage (Independent Monitoring Board of the Global Polio Eradication Initiative, 2019). Communities with high refusal rates do not trust that those in power have their best interests at heart, using their lived experiences of marginalisation and deprivation as evidence. The IMB suggested that authentic dialogue, truly listening to and addressing the needs of these communities, could be a key facilitator for eradication.

In its 2019–2023 strategic plan, the Global Polio Eradication Initiative (GPEI) mentioned 'expanded integration efforts' as a central mechanism for eradicating Wild Polio Virus (WPV)

and ending Circulating Vaccine Derived Poliovirus (cVDPV) transmission by integrating OPV within a package of other health services (Independent Monitoring Board of the Global Polio Eradication Initiative, 2019). The IMB further recommended GPEI investment in programmes such as water, sanitation, and hygiene (WASH), which would both save lives and show that the polio programme truly cares about improving the health and well-being of children, not 'solely viewing them as potential polio-spreaders'. Yet progress on this front has been slow, and vaccine rejection and violence remain issues (Independent Monitoring Board of the Global Polio Eradication Initiative, 2021).

In these communities, social exclusion plays a key role in vaccination distrust and rejection, which can be framed as an act of resistance. Socially excluded groups may not believe that systems of power – such as the government or global health initiatives – care for their wellbeing, and may be sceptical of the initiatives they sponsor (Cooper et al., 2021). In the tribal regions of Pakistan, long-standing marginalisation has driven communities to utilise vaccination refusal as a strategic tool to address perceived grievances with the federal government (Maqsood, 2019; Naseemullah, 2014). This dynamic is linked to a broader struggle for equitable development funding and social rights (Khan et al., 2020).

Social resistance can also produce – and feed on – rumours, which live in the space between knowledge and belief, offering credible explanations for experiences within contexts of uncertainty (Samuels, 2015). Rumours have been detrimental to past polio eradication efforts, encouraging resistance (e.g. Northern Nigeria (Taylor et al., 2017)) and violence (e.g. Pakistan (Khazan, 2012; McGirk, 2015)). In the Pakistani context, social resistance emerges from a multifaceted interplay of religious beliefs, conspiracy theories, misinformation, insecurity, and conflict (Ataullahjan et al., 2021; Hussain et al., 2016; Ittefaq et al., 2021; Kennedy, 2017).

Communities demand improved infrastructure, health facilities, and basic necessities, often orchestrating protests and tactical boycotts of polio campaigns (Faizan et al., 2024; Hakeem & Hussain, 2022). These boycotts have yielded successes, even influencing the resolution of local disputes (Khan, 2019). Ultimately, the struggle for recognition and resources becomes intertwined with the polio eradication agenda in these regions, a phenomenon we examine in this paper from the perspective of the polio programme staff.

Here, we present frontline workers' perspectives and ideas for changing the ways in which they engage with communities to increase social justice and help improve the health of these communities more broadly. Frontline polio workers feel strongly that *decreasing* touchpoints and working on the provision of additional services would improve vaccine uptake and the perception of the programme in the community.

Methods

Overview

The primary objective of this study was to better understand the complexities of developing and sustaining relationships with target communities in our study setting by eliciting the experiences and perspectives of polio staff. We engaged a range of staff members of the polio programme operating within a major SHRUC in Pakistan, encompassing various administrative tiers through interviews, a Human-Centred Design (HCD) ideas competition and participant observation.

The central portion of our implementation research was structured as a Human-Centred Design (HCD) ideas competition. This process, called 'IMPACT', conducted in two rounds between 2020 and 2022, engaged teams of FLWs in identifying key challenges they encountered in their work to achieve polio eradication, and proposing solutions to these problems. FLWs, mostly women, expressed their perspectives on priority issues through written descriptions of problems, root causes, solutions, and implementation strategies.

Our team read and summarised handwritten idea submissions, grouping similar ones. A scoring rubric guided the longlisting process, with input from the research team, district, and provincial leadership. Shortlisted teams pitched their ideas in a competition, with panel-selected winners proceeding to implementation. Across two rounds, nearly 200 ideas from over 170 teams were submitted, with nine chosen for implementation. This method is described in more detail elsewhere (Sultan et al., 2023). These ideas submissions from FLWs were scanned and translated, and the contents were used to develop this paper.

In addition, we conducted 116 in-depth interviews with a diverse range of staff, from FLWs, to international programme planners. The interviews analysed within this paper were designed to provide context for our IMPACT sessions, and occurred before round one, between rounds, and after round two. These semi-structured interviews were approximately 45 minutes and our interview guide covered topics relating to experiences in the workplace, experiences with refusal households, violence in the community, as well as reflections on our IMPACT process. We digitally recorded the interviews after the participant provided consent. Interviews were conducted by members of our research team who were fluent in the language of the interview. We transcribed all interviews and translated them into English. Interviews were analysed using inductive codes developed and iterated by a subset of authors.

In addition to in-depth interviews and idea submissions, we conducted participant observation of routine data collection and vaccination activities during the June 2021 polio campaign – following FLWs to understand the unspoken components of an average workday.

We sought ethics approval from the Johns Hopkins Bloomberg School of Public Health Institutional Review Board who deemed this work to be non-human subjects research (IRB# 13666). Orally obtained informed consent was sought from all participants in this study. The utilisation of oral consent was a deliberate choice, considering the diverse literacy levels among participants, facilitating digital interview formats, and mitigating the risk of confidentiality breaches. The research team conducting the interviews, who had training in conducting human subjects research, obtained consent from all participants prior to initiating the interview.

Data analysis

After transcription, we, four qualitatively trained researchers inductively coded a subset of the English transcripts using a computer-aided qualitative data analysis software (MaxQDA). We convened virtual meetings to discuss emerging themes within that subset. During these sessions we iteratively and inductively developed a codebook, which we used to code the remaining interviews.

Roles and responsibilities

In the results section, we highlight several different professional positions throughout the Polio vaccination infrastructure in Pakistan. It is important to note how these positions relate to each other to make any structures of power visible, and to point out the types of experiences that certain roles could potentially draw upon. To start, positioned at the foundational level of the polio structure in our study setting are female Frontline Workers (FLWs), responsible for conducting door-to-door visits approximately 10 times annually. Their duties encompass administering the Oral Polio Vaccine (OPV) to children under five and collecting data related to immunisation coverage and family compositions. Accompanying them are female Social Mobilizers (SM), whose role includes encouraging families to vaccinate their children and aiding in data collection. To ensure their safety during fieldwork, FLWs and SMs are accompanied by a police escort. These frontline workers (FLWs), as we refer to them in this paper, also include Area Supervisors (such as Hira), Area Level Social Mobilizers, and a few male Additional Learning and Supervisory Mobilizers (ALSMs).

Supervision within each SHRUC is provided by Union Council Polio, Delivery, and Communications Officers (or, UCPOs, UCDOs, and UCCOs), who are predominantly male (with some exceptions), particularly within the UCDO cadre. Overseeing them is the Emergency Response

Unit (ERU), primarily composed of male staff members, and manage all polio-related activities within the SHRUCs. At higher levels, Emergency Operations Centres (EOCs) direct operations at the provincial and national tiers.

Notes on collaboration and change

The polio programme has a dynamic and ever-changing environment. We are deeply grateful to all those who helped us, from FLWs to higher level officials for allowing our findings to facilitate real change. The stories and suggestions we present in this section, and many more we did not have space for, have resulted in reflection and change within the programme. The results presented herein offer a momentary snapshot, while ongoing positive changes within the programme persist.

Results

Is communication enough?

Polio campaigns in SHRUCs in our study site involved multiple visits each month by FLWs who, partnered with SMs, encouraged polio vaccination – particularly among refusal households. However, these acts of continual engagement have pushed some communities to the point of fatigue. FLWs are required to visit every single household in their area multiple times every campaign cycle, even in the event of hostile resistance. FLWs are required to provide a reason for each refusal, and workers from progressively senior cadres visit the household until the family is finally convinced to vaccinate – although what sometimes ends up happening is that they shut their doors to the programme entirely.

In June 2021 our team observed FLWs and their managers over the course of 30 days. We found that many households were often contacted by a FLW/SM team 5 times over the course of 6 weeks, since these workers also contribute to routine immunisation activities. Apart from vaccination, FLWs and managers visited households for mobilisation, outreach, data collection, and educational sessions. This plethora of visits typically included a pre-campaign visit involving a mini census activity, as well as social mobilisation and vaccination visits.

If the household refused either routine vaccination or OPV for their children, the door knocks increased substantially, well above the typical number of door-knocks in a single 6-week period. FLWs were also occasionally directed to ask for demographic indicators such as tribe, sub-tribe, sect, and caste, which many community members felt was deeply personal information. Often, this information was requested multiple times. When we were in the field during data collection, we saw community members getting visibly irritated with the repeated collection of the same information, complaining that 'if there is nothing new, why do you keep coming?'

This also created a difficult situation for workers, as a Union Council Manager explained:

> Once, I visited a refusal who told me that when a patient is bedridden for more than a year, his family members pray for his death. Adding that, 'You people have been doing this job for the last 26 years. Now stop it, we are tired!'

At higher levels, there was a perception that FLWs keeping in touch with the community was desirable. However, some were aware of the repercussions of repeat visits. As one senior official, speaking about the impact of excessive non-vaccination visits, put it:

> We push households closer to refusal every time we knock at the door for any reason other than vaccination.

Many workers expressed that there would be more acceptance for their work in the community if they had *fewer* household visits, particularly fewer visits without value for the people they visited. FLWs found it increasingly more challenging to establish and maintain constructive relationships because of the repeat visits.

Disagreements on what to prioritise

We followed Hira and the other frontline workers to their meeting spot at a government dispensary after the day's activities. The dispensary was dilapidated – the staff contributed a proportion of their salaries to have fans installed there, which served to whip up the stench of sewage flowing freely from a nearby broken water line. However, the intermittent electricity meant that even this often did not happen. Hira exclaimed as she entered, 'Everything the government does is 'fazool' [pointless]. The government also values quantity over quality'.

In an interview, a district level supervisor took stock of the poor quality of care at the health centres and its impact on community support:

> A Nazim [Mayor] mentioned that when the community visits these centres benches are broken and there is no sitting place for pregnant women, they must stand for a long time. There are no facilities in the labour rooms or even stocks of Panadol [Paracetamol]. How can we expect the community to support our work?

The district level supervisor mentioned that some health centres were scheduled for refurbishment, though rapid improvement was unlikely. These gaps in quality extended beyond just health services and into nutrition, sanitation, education, and other public works. One polio worker further conveyed the sense of frustration among communities about what they saw as misaligned priorities:

> They tell us, 'You are talking about health and hygiene—why don't you look at the garbage outside our houses? You come inside our houses and give us lectures about hygiene. Why don't you look around? Garbage is there outside our houses where our child goes and plays, and then gets infected and sick.'

At higher levels in the programme, officials shared similar frustrations, highlighting the relationship between malnourishment and polio transmission:

> There are places where you need water. They don't have water. There are 40% of children from the last report I saw, they're malnourished. Some of the children who are malnourished, they cannot seroconvert, even when you give them vaccines. They cannot seroconvert those vaccines to get immunity. Those are the deprived communities that are coming down with polio.

Transmission of polio through the oral-faecal route was also noted to be a significant concern in this setting, where sewage lines were entirely uncovered. As one UC level official noted:

> All the [sewage] drains are open, children put their hands in the drains, they take out balls from these drains while playing cricket. During the rains, when [sewage] water overflows, children play in this water.

These conditions not only contributed to the perpetuation of polio but also to the under-5 mortality rate in Pakistan, which averaged 86 deaths per 1000 live births for the 11-year period from 2007 to 2018 (National Institute of Population Studies – NIPS/Pakistan & ICF, 2019).

Polio staff and communities alike felt that programmes like the GPEI would benefit from doing much more towards addressing these basic needs, as they interlinked with polio. A higher-level official told us:

> If we don't solve these issues, it will keep coming back, [polio] will keep coming. If we don't solve the issue of EPI [routine immunization], if we don't solve the issue of integrated services, water, nutrition, felt needs in those communities, it will keep coming back. These are the basic root causes … . The root cause is neglect.

'Why are you trying so hard?'

Parents knew the programme had enough resources to dispatch frontline workers to their door multiple times a year; they also knew that high polio vaccine coverage rates were important to the programme. They used this knowledge to advocate for resources to provide for and protect their children. Many interviewees described coming across these demand-based refusals:

> Many people tell us to bring resources to their homes, then they will vaccinate their children. [They tell us] 'You guys have nothing else to do but come for vaccination'. Some people demand medicines because when

> they go to the CD [Civil Dispensary], they don't get medicines. Even if there is medicine available, the people who work there do not give it out.

> They are demanding medicine, chocolate [Ready to Use Therapeutic Food or RUTF] and Lux Soap, which are provided by UNICEF … Sometimes they say 'Bring [RUTF], then we will give polio drops to our children'.

Community members have been told repeatedly by FLWs, local influencers, higher level polio staff, and mass media that polio vaccination will improve the health of their children. But the circumstances these families live in make it seem to them that national and international agencies do not generally care much about the health of their children. Often, this space of uncertainty was filled with rumour. As an Area Supervisor shared:

> They [the community] present their views that America does not care for their children, and this is a scheme to commit genocide … [They say] 'If America wants our well-being, she would support us to get food and assist us financially.'

An ALSM we spoke with conveyed common trends in comments from the community:

> The most suspicion comes with the question 'But why are you trying so hard? We have water shortages, electricity shortages, gas shortages, shortages of everything. Medicines are expensive. So why? Why are you so focused on polio? Going to each house, each and every child in Pakistan, and wanting us to allow you to feed it [polio drops] to them. Why? There is no such focus on other things in Pakistan, so why polio?'

Even if the given reason for a refusal was negative perceptions of the vaccine itself, polio staff felt that the primary issue was a desire for the programme to provide necessities, complexifying the narrative. As one UC Level Manager commented:

> If you investigate refusal cases, the majority of them are based on demands … Families demand chocolate [RUTF], or medicine, for their children, but they will tell us 'Your vaccine is not good.' They don't ask you directly for what they want. We record those refusals as based on misconceptions, but behind the scenes there is another story … When we provide them chocolates [RUTF] or medicine, then they easily accept the polio vaccine.

While polio workers maintained a general sense of confidence in the vaccine, their ability to address community concerns, particularly regarding vaccine ingredients, was at times limited. In our brainstorming sessions, multiple groups of FLWs proposed the need for supplementary training. Expressing frustration due to the influence of rumours, and inadequate training, an ALSM we interviewed remarked:

> There's that old line, 'Until truth appears, lies will destroy the world.'

Sehat Muhafiz (protectors of health)

Over a third of all teams in our brainstorming sessions had ideas for improving community relations, primarily involving the provision of more varied services to the community; FLWs wanted to take on the general label of *sehat muhafiz* (protectors of health). Teams of FLWs described the corrosive impact of poor government services on perceptions of health workers in general, which they understood to have a knock-on effect on the polio programme. Many teams said that they wanted an expanded role to reposition themselves within the community.

One team suggested using a referral slip system to connect community members to health centres, as well as allow them to hold health centre staff accountable for inaction on referrals sent their way. The team noted the following potential outcomes of such a system:

> This will improve the health services in the area, and will not only address community complaints of discrimination, but will also change the perception of community towards FLWs, and will lead to our recognition as supportive health workers. A positive attitude towards FLWs will make their job easy in the community and they will be able to address refusals.

Implementing such a system is challenging in practice, however, given the existing functional boundaries between the poorly funded health centres and the well-funded polio programme.

Building on the notion of being supportive to communities, one FLW team wrote that, since polio FLWs have the most information on where pregnant women live due to their regular data collection, they should have baby kits to give to households when the child is about to be born. A common refrain heard from the community by FLWs was that 'you come here to give two drops while there are no other services for us;' they felt that providing tangible benefits would improve how they were viewed.

A FLW in an endline interview spoke about her desire to do more to help water and sanitation in the area she covered, since it had a direct impact on the advice given to prevent the spread of disease within the community.

> [If I could] I would try to fulfil as many needs as possible. The area I work in doesn't have a proper sewerage system. I would like to fix that issue for them and provide them with clean water because when I suggest that they should use clean water and stay away from polluted water, they respond that they don't have any source of fully cleaned water.

In other interviews with FLWs, they articulated similar sentiments, wishing they had more to give:

> Some of the families demand chocolate [RUTF], medicine, or multivitamins, and we have to explain that we cannot provide them. We also want to give [people in our community these] things, but we don't have anything to give.

Some FLWs felt being involved with more direct-assistance government programmes, such as a cash-transfer initiative, could also strengthen their relationships with the community. One respondent explained:

> EHSAS [cash transfer] program money … . would help us strengthen our bond with the community. Especially with the refusers because they are the ones who demand for it the most.

All of this, FLWs argue, could shift community perceptions to seeing them as allies empathetic to the needs of the community. This was framed as a deliberate strategy by some frontline workers, but others felt that it was a moral calling. Many structural challenges are outside of the current purview of the current polio programme. But frontline workers called for a wider lens, extending their work into additional domains concerning the health and wellbeing of the communities they work with.

Labelling themselves as *sehat muhafiz* [protectors of health] would, workers hoped, shift the narrative from one where workers are seen as a nuisance – threatened with violence – to one where their repeat visits held more meaning than just the eradication of polio. Repeat visits could, they argued, then function to help families access the services they want and need, rather than offer them a solution to nothing but one disease. While the structural and social determinants of poverty and poor services extended far beyond the scope and capabilities of the GPEI, people at multiple levels of the programme argued that expanding training and integrating with other government services could help form better relationships with the community. We heard calls for integrated services – GPEI resources going to provide food, medicines, primary health care, and sanitation services – from workers across cadres.

Some FLWs have taken up the task of campaign co-delivery themselves, despite not being officially supported by the programme in this task. A CHW we interviewed recounted providing medicines, and how it helped her gain acceptance for OPV in the community/household:

> People in my area said that their children had fever and a cold, so we brought medicine from the CD [Civil Dispensary] and gave it to them. The family was very happy that we took care of their children. That's how I covered three children in this house.

In the campaign during which we conducted participant observation, we heard FLWs, such as Hira, advertise an upcoming health camp to the households they visited, as a site for community members to get health needs met that they could not provide for. This polio programme initiative was welcomed by frontline workers. As Hira said:

> I always mention the medical camp because these people can't afford medicines, and there they can get them for free. We frontline workers shouldn't only do immunizations. These people need folic acid and vitamin C. Why do we only tackle polio?

A higher-level official said that adding health camps, pop up temporary medical facilities where people could get health screenings and routine medications, was a game changer for bringing down refusals during his work in Northern Nigeria, where WPV was eventually eliminated:

> We tried to use different innovations, community and influencers, religious leaders, and all that. What broke the camel's back was when we were using health camps, when we introduced health camps or services, water, sanitation in those areas. These were incentives that attracted people … They started accepting the vaccines.

Discussion

A distinct narrative emerged from our interviews, discussions, and observations with staff in the polio programme. Communities conveyed to polio staff that they were tired of the frequent and intrusive visits, and called for honest concern to be demonstrated through action to improve the socio-economic conditions they were living in.

Our work aligns with existing research (e.g. Abbasi et al., 2023; Ataullahjan et al., 2021), showing that frontline workers commonly identified mistrust, coercion, religious motivations, and conspiracy theories as drivers of social resistance against the polio vaccine. But our material also shows that the analysis should not end there. Mistrust and rumours are symptoms of larger trust issues; these larger issues are structural.

Attitudes toward vaccination are not always just attitudes towards a vaccine. In the city we describe here, people who refused vaccination often did so despite being perfectly convinced that the vaccine was in fact beneficial – a phenomenon exemplified by demand-based refusals.

FLWs repeatedly noted that resistance waned when communities received resources beyond the vaccine itself. Senior programme officials concurred, recognising the potential for smoother vaccination activities when basic necessities were fulfilled. Our findings expand on Hakeem and Hussain's observation (2022) that social resistance is rooted in a lack of socio-economic development – and that this factor significantly contributed to the challenges and even violence encountered by FLWs.

Many popular models of vaccine acceptance – for example, WHO's Behavioural and Social Drivers of Vaccination framework (World Health Organization, 2022) – do not consider many (if any) structural factors external to a given vaccination programme. Yet as this example so strikingly illustrates, it is often impossible to understand resistance to vaccination without attention to other factors: in this example, the quality of urban infrastructure, experiences at the health centre, and the very fact that the polio programme was so persistent all played a role in turning people away from vaccination. Shah et al. (2019) found that journalists understood the frustrations that the frontline workers articulated within our paper. Journalists argued that communities partially refused the vaccine as a form of resistance against the failure of the government to make developmental improvements to their areas (Shah et al., 2019), further corroborating our findings. This tension is also briefly captured by several other authors (e.g. Faizan et al., 2024; Irwin, 2023; Soofi et al., 2023), and solidifies this particular challenge for meaningfully engaging with communities.

Taking structure seriously, as our respondents repeatedly did in this work, brings other issues to the fore, and illustrates the severe limits of thinking about vaccine hesitancy as a psychological or individual issue. The example of polio in Pakistan presents several take-aways for ongoing discussions of addressing vaccine hesitancy.

(1) Real changes in service provision, not just changes in communication, are critical

Institutional change, rather than simple communications, may need to be a key part of promoting vaccine acceptance. Several researchers recently noted, reflecting on hesitancy around the flu

vaccine, 'instead of continuing to focus on why minority groups may not be trusting, it may be time for researchers to focus on what institutions can do to increase their trustworthiness' (Jamison et al., 2019). The Pakistani context is a challenging one for building trustworthiness, as mistrust among the dominant ethnic community in the northwest of Pakistan is linked to their systemic marginalisation and based in a historic mistrust of State actors (Maqsood, 2019). Hakeem and Hussain describe how this mistrust at times has an inertia, with local communities seeking to avoid community health services (such as polio immunisation activities) for fear of signalling their acceptance to extreme elements in their community.

Yet, there is a way forward for building trust. At the same time as they may resist polio vaccination, these communities seek a greater provision of government services. This tension points to a way forward: the gradual expansion of basic services and additional health services beyond polio. During our brainstorming sessions, many FLWs voiced an urgent need for greater integration with other government services. Numerous FLWs extended support through the provision of medications and nutritional supplements, whenever they could, and felt less resistance after doing so.

Teams in our brainstorming sessions also felt that honest engagement with communities was necessary. As mentioned, FLWs empathised with the needs of the community, however, they also acknowledged the limits in their ability to provide broader services – especially where demands extended into the realms where they had no control (e.g. social security and public works). FLWs were well aware of the dangers of short-term incentive programmes and argued instead for long-term strategies. Still, they desired greater control in raising the standards of health centres at the very least. Substantial structural changes sit within the purview of local government leadership who can affect these communities in substantive ways, achieving both the development and health goals desperately sought by their constituents. The interviews and brainstorming sessions revealed that FLWs were more than ready to expand the scope of their relationship with the community should local leadership support them to do so.

Integration is not a simple task and can pose a substantial risk for health systems if the integration requires significant investment, training, added resources, shifting policies, as well as revised protocols and practices (Deressa et al., 2020). National and international level stakeholders may be required to accept and commit to long horizons for integration to be fully achieved. Pakistan's infrastructural and organisational shortcomings around the provision of health care at multiple levels (Atif & Malik, 2020) also put it at significant risk of being over-burdened. This risk highlights a need to determine the nature and definition of what integration means to different stakeholders. During our brainstorming sessions, FLWs acknowledged that many of these challenges with integration would not be solved within a brief period but required commitment and hope of better long-run outcomes for not just the programme but the community as well. They stressed, however, that such investments were critical for the eradication of polio. Investment in health equity, they argued, is what we will need to succeed in this last mile – especially in contexts where the programme has worn out its welcome.

(2) Sometimes hesitancy is the wrong frame

In the last ten years, 'vaccine hesitancy' has replaced 'vaccine refusal' as the standard term used when talking about people who may prefer not to be vaccinated, or to vaccinate their children. In a recent review in the New England Journal of Medicine, Heidi Larson and colleagues defined vaccine hesitancy as 'a state of indecision and uncertainty that precedes a decision to become (or not become) vaccinated' (Larson et al., 2022).

Certainly, there are many good reasons to think about vaccine hesitancy in a range of settings – and here, rumours exemplify the fact that many people were uncertain. But vaccine hesitancy as a concept does not accurately describe many of the dynamics at play in this setting. While much of the local literature reports extensively on the numerous reasons for hesitancy (e.g. risk perception,

social and religious barriers, etc) they overlook junctures where parents understood the benefits but resisted anyway (e.g. Abbasi et al., 2023; Habib et al., 2017; Habib et al., 2017; Saeed et al., 2018; Shafique et al., 2021; Shakir, 2022). We find that people who were frustrated about the contrast between polio activities and other services in this city in Pakistan were not always uncertain about the vaccine. On the contrary: they were angry. They were staunchly opposed to priorities of the government, an opposition borne not of uncertainty, but in a certainty (rooted in fact) that their most severe problems were being ignored even as polio vaccination was repeatedly delivered.

(3) Rumours are tied to realities

Communities filled the void of uncertainty created by frequent polio visits and general government neglect with rumours. Rumours, medical anthropologists have observed, live in the space between knowledge and belief; they arise in spaces of uncertainty (Pertwee et al., 2022; Samuels, 2015). Regarding HIV rumours in Papua, Indonesia, Leslie Butt observed that they reveal 'observations about disjunctures' (Butt, 2005).

Rumours about ulterior motives behind the vaccine were common; they were fuelled by very frequent visits by polio workers providing only polio vaccine, while other services remained unprovided. FLWs felt inadequately trained to alleviate much of the uncertainty around the polio programme and stressed that they wished to be provided with talking points to counter the conspiracy theories. Yet talking points were unlikely to get at the source of these rumours, which was the real disjuncture between the activities of the polio programme and these communities' other interactions with government and international actors. This was a situation almost tailor made to fuel uncertainty.

(4) More is not always better

One somewhat counter-intuitive, but very clear, finding from this work is that more engagement with vaccine hesitant parents is not always better.In this example, repeated visits from CHWs were driving vaccine hesitant parents toward active resistance to the programme.

High-level recommendations on addressing vaccine hesitancy commonly present social mobilisation, including interpersonal contact, as an effective way to increase vaccine coverage (Jarrett et al., 2015; World Health Organization, 2022). In many settings, such strategies do work. But if that engagement is one-way – i.e. trying to convince parents to vaccinate without listening to what it is that they need, and responding to those demands and concerns – more engagement can backfire (Neel et al., 2021). The quality and texture of the engagement – or, the extent to which it is based on responding to community needs – is the important ingredient here. The FLWs in this study did hear community concerns. But they had very limited ability to respond to those concerns.

The relationship between vaccine providers and vaccine recipients is bi-directional, and in many settings people have excellent reasons to distrust medical providers. This is an equity issue, as it is often the most marginalised populations who have had negative experiences with the governments or institutions providing vaccines. Extensive vaccine communication activities in these settings – especially those developed for different contexts – can exacerbate hesitancy, fuelling conspiracy theories about why a vaccine for a disease not even seen as a problem is being pushed so hard when other obviously critical health services, such as primary care and chronic illness management, are low-quality or non-existent. In such a context, repeated engagement drives resentment and anger. Building longer term partnerships with communities by providing critical services to places that need it the most may be beneficial; FLWs, who in some cases see themselves as more than just providers of polio drops, may be readily willing to support the provision these expanded services.

This study has limitations, which also present opportunities for future research. For example, a perspective from the communities being vaccinated would have added a further angle to the findings. We predominantly represent the perspective of the polio programme staff and how their interpretations of their interactions with the community, and with the programme, influence the work they do. Critical perspectives on those interactions are limited to the worldviews and experiences of the polio staff. The perspectives of the community could have added further contrast or support to our findings. Future research could undertake a deeper exploration of these relationships.

It is also worth noting that the bodies involved with the GPEI in Pakistan were receptive to the findings of this research and implemented changes based on them prior to this publication. As such, the GPEI is better understood to be an evolving initiative which was not fully captured in the interviews we conducted. A full examination of the evolving nature of the GPEI, and the relative impacts of different policy changes is an avenue for future research.

This research could have further been strengthened through a broader exploration of the socio-economic inequities and/or realities of the populations who most frequently refused the vaccine. This remains a space for future research to explore.

Finally, future research could explore the basis of rumours, gossip, and conspiracy both within communities and within the polio programme itself. This research could focus on what the rumours, gossip, and conspiracy theories are doing for the people that create, internalise and perpetuate them – approaching the topic from a neutral perspective.

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