KEY CONSIDERATIONS: LOCALISATION OF POLIO VACCINATION EFFORTS IN THE NEWLY MERGED DISTRICTS (TRIBAL AREAS) OF PAKISTAN

SSHAP
Social Science in Humanitarian Action Platform

Poliomyelitis (polio) remains a vital global public health challenge, particularly in countries where eradication efforts are ongoing. For almost three decades, polio programme and frontline workers in Pakistan have suffered human and financial losses due to complex political and bureaucratic management, local resistance to programme efforts, and the context of cross-border insurgency and insecurity.[1] Many stakeholders in Pakistan continue to have low confidence in frontline workers and polio vaccination campaigns. In this environment, it is essential that vaccination programmes localise – by taking careful account of the local context, improving local ownership of the programmes, understanding and mitigating the issues at a grassroots level, and tailoring efforts to achieve polio eradication goals.

This brief draws on evidence from academic and grey literature, data on polio vaccine uptake, consultations with partners working on polio eradication in Pakistan, and the authors' own programme implementation experience in the country. The brief reviews the social, cultural, and contextual considerations relevant to increasing polio vaccine uptake amongst vulnerable groups in Pakistan's tribal areas. It focuses on the current country context, in the aftermath of the 2018 merger of the former Federally Administered Tribal Areas (FATA) into Khyber Pakhtunkhwa province (KPK).

This brief is part of a series authored by participants from the SSHAP Fellowship, and was written by Luqman Hakeem and Riaz Hussain from Cohort 2. Contributions were provided by response partners in Pakistan including health communication and delivery staff and local administrative authorities. This brief was reviewed by Muhammad Sufyan (University of Swabi) and Ilyas Sharif (Quaid-e-Azam College of Commerce, University of Peshawar). The brief was supported by Megan Schmidt-Sane and Santiago Ripoll at the Institute of Development Studies and is the responsibility of SSHAP.

KEY CONSIDERATIONS

- Programme implementors can consider ways to adapt polio eradication efforts to local contexts, particularly given the new political context, to improve local ownership of the programme. This could include improving social mobilisation at a local level, improving long-term engagement with local 'influencers,' and identifying and linking up with other health and social programmes to better integrate polio eradication and build trust with communities. This may also require working with the local *Jirga* system (see Box 2 below) and local leadership to restore the system to its prior status.
- Conduct a rapid ethnographic assessment to understand the new (post-2018) political-economic context, tribal systems and power dynamics and the key stakeholders to involve in polio eradication efforts, and to collect information on major gaps in the efforts. This will enable the polio eradication programme to better provide immunisations, as well as to meet other basic health needs.[2]
- Involve local-level religious leaders like imams and notable clerics, and tribal elders and *maliks* (elected elders). People are influenced by such figures because of their dominant position and strong influence on tribal society. They can be enlisted to deliver important messages during religious events and congregational prayers.
- Adapt vaccine efforts to the local context, particularly in tribal areas of Pakistan. Polio vaccine hesitancy in tribal areas is, in part, shaped by relatively low awareness and acceptance of the vaccine, misconceptions about the vaccine and the vaccine programme, and social, cultural, and religious concerns.

- Conduct research in targeted locations where there are more vaccine refusals and higher numbers of confirmed cases, to analyse preferred communication channels for people to receive information. These may include social media, electronic/print media, house-to-house outreach, mass awareness campaigns, radio, theatre, and other channels.
- Use social media to raise awareness as it is not currently used effectively for polio vaccine campaigns. Who people trust varies at a granular level, therefore local level influencers can be used to reach people in locations where there are more refusals or a higher number of cases.
- Continue robust monitoring and surveillance for fake finger marking – the marking of a child's finger to avoid polio vaccination - bearing in mind that this should be addressed in a sensitive way during campaigns in tribal areas.
- Increase human resources and rely on permanent staff instead of hiring casual workers during campaigns. Permanent staff are more experienced and have vital technical skills, whereas new casual workers need training; this can lead to high staff turnover. Recruit vaccination staff locally from the tribal areas; these workers are familiar with the context and are more accepted by the community. Where possible, recruit female workers.
- Provide sufficient resources and logistics support, including transportation, training, stationery, Information, Education & Communication (IEC) materials in Pashto, protective equipment, refreshments, and additional incentives and expense reimbursement during campaigns. This increases field staff motivation and reduces staff turnover.

BACKGROUND

Enormous gains have been made in the global eradication of polio. It remains endemic in only two countries in the world: Pakistan and Afghanistan.[3] Pakistan's population includes more than 30 million children under five and around 70 million children under 15. Children are more vulnerable to polio and its lasting effects, which makes eradication efforts all the more critical.[4,5] Polio cases have largely emerged in the Pashtun tribal region, which spans both Pakistan and Afghanistan. Wild poliovirus was detected through environmental samples in 2021 in Khyber Pakhtunkhwa Province in Pakistan's former Federally Administered Tribal Areas (FATA).[6] In April 2022, Pakistan reported one case of wild poliovirus type 1 (WPV1) in North Waziristan, Khyber Pakhtunkhwa, and this area continues to be the most at risk in Pakistan.[6] Although there are new opportunities for action on polio given shifting political arrangements in the region, these opportunities are complex. Localisation and community engagement efforts are needed to make further progress in polio eradication.

Box 1. Poliomyelitis (polio)

Poliomyelitis (polio) is a highly infectious viral disease that mainly affects young children. The polio virus is transmitted by person-to-person contact and spread mainly through the faecal-oral route or, less frequently, by contaminated water or food.[7] The initial symptoms of polio include fever, fatigue, headaches, vomiting, neck stiffness, and limb pain. In a small proportion (less than 1%) of cases, the disease can cause paralysis, which is often permanent.[8] There is no cure for polio, and it can be prevented only by immunisation.

There are three serotypes of wild poliovirus (type 1, type 2, and type 3), each slightly different. Immunity to one serotype does not confer immunity to the other two.[9] In the early 1900s, polio was recognised as pandemic. During the 1970s, routine immunisation was introduced worldwide as part of national immunisation programmes, helping to control the disease in many developing countries.[10,11]

Pashtun tribal areas in Pakistan and political integration

Pashtun tribal areas of Pakistan face prolonged and ongoing insecurity and governance issues.[12] Geographically and politically, the tribal areas constituted Pakistan's FATA. In 2018, FATA was renamed (Newly Merged Tribal Districts) and incorporated into Khyber Pakhtunkhwa Province, meaning Pakistan's federal constitution and governance structures now apply to the region.[13] This incorporation brought an end to the 1901 Frontier Crimes Regulation, a colonial-era law which

codified the authority of the tribal *malik* (an elected elder) and legal political agents, who initially served as representatives of colonial interests.[14] The law, in practice, meant that FATA residents did not have full constitutional rights as citizens of Pakistan. However, FATA integration has been controversial; tribal elders and some political parties have opposed it, instead advocating for FATA separation.[14,15] Some elders have argued that integration cleared the way for government extraction of the region's valuable natural resources;[15] other elders focus on the loss of their tribal dignity and the *Jirga* system, which they consider the most valuable part of their culture (Box 2). Younger generations, however, have largely supported FATA integration.

Box 2. The Jirga System

The Jirga system is considered a trusted way of solving local disputes among the Pashtun which the government cannot do on their own, without the buy-in of this system. Noble elders from different tribes gather and agree upon certain conditions to resolve the issue. Similarly to how the government is not trusted to resolve local disputes, polio staff are also often less trusted by Pashtun communities to 'resolve' the 'problem' of polio.

Drivers of cross-border polio circulation

The traditional Pashtun homelands between Pakistan and Afghanistan are divided by a 2640km land border known as the Durand Line. People living near the border have close family ties on both sides and there is heavy cross-border traffic throughout the year. This movement contributes to wild poliovirus transmission across the region.[16,17] To control the cross-border transmission of polio virus, Pakistan and Afghanistan made polio vaccination mandatory for all travellers crossing the border. However, there are illegal border crossings between both countries, which makes it more difficult to monitor vaccination status.

At airports, it is mandatory for travellers to and from Afghanistan or Pakistan to have their vaccination cards checked. However, authorities are reluctant to follow this regulation and most travellers pass without verification. In addition, it is very easy for people in both countries to obtain a signed polio vaccination card from government medical doctors without actually having been vaccinated.

After the Taliban takeover of Afghanistan, tribal people in both countries have been more likely to resist polio vaccination. Previously, many opposed vaccination efforts for political and social reasons, and this opposition has been emboldened as Afghanistan is now under Taliban rule. Some communities have felt validated in their mistrust of the programme and may feel more confident to oppose vaccination efforts. This is largely due to the political and cultural alignments between some tribal groups in Pakistan and the ruling Taliban in Afghanistan. Given the geographic and cultural integration across the border, rumours and conspiracy theories about vaccination in Afghanistan will influence polio eradication efforts in Pakistan as well.[18]

STATUS OF POLIO VACCINATION IN PAKISTAN

Pakistan Polio Eradication Programme

The Pakistan Polio Eradication Programme started in 1994 to end polio transmission in the country. Through its efforts, the number of cases has declined by 99% from the 20,000 cases that were reported annually in the early 1990s. In 2019, 147 polio cases were reported in Pakistan; there were 84 reported cases in 2020, and only two reported cases in the last 12 months. The recent 2021 Technical Advisory Group on polio eradication in Pakistan highlighted the paradox that when disease eradication is in the 'last mile,' or near its goal, targeted disease initiatives may become less of a country-level priority.[19]

The polio eradication strategy is based on immunising 80-85% of children until transmission stops. Throughout the year, the programme implements high-quality vaccination campaigns that aim to reach all children under the age of five across Pakistan. The programme vaccinates over 40 million children during each national immunisation day campaign,[20] with doses administered by over

285,000 frontline health workers who go door-to-door to make sure that every child in Pakistan receives the vaccine. In addition to the national immunisation day campaigns, vaccines are administered throughout the year via routine OPV immunisation, sub-national immunisation days, supplementary immunisation activities, and 'mop-up' activities such as campaigns in specific areas after confirmation of a case. In 2018, 75% of children under one in Pakistan received three polio vaccine doses. In 2020, 83% of children under one received three doses, an improvement over the preceding two years.[21] This is despite the fact that an April 2020 campaign was delayed by the emergence of COVID-19.

The Polio Eradication Programme also undertakes highly sensitive surveillance and detection and response activities to track and limit virus transmission across the country, as well as communication and social mobilisation activities which encourage health-seeking behaviours amongst communities.[1]

The programme, while largely successful, has also been marked by complex challenges. Politicians and bureaucrats have interfered with the governance and management of the programme, and programme funds have sometimes been used for personal or political gain. Tribal politics have also come into play. For decades, various tribes have complained that members of the ruling party excluded them from positions with the programme, while recruiting the politicians' 'own people' as workers. Members of some tribes will not allow their children to be vaccinated by workers from other tribes, particularly those of their political rivals. Finally, authorities have also warned that the large number of Afghan refugees coming to Pakistan may present a new challenge to polio eradication efforts in the tribal areas.

Key stakeholders in polio eradication

Key partners of the Pakistan Polio Eradication Programme include the World Health Organization (WHO), Gates Foundation, GAVI the Vaccine Alliance, UNICEF, and the Global Polio Eradication Initiative. Key stakeholders at the local level include health care workers (doctors, nurses, vaccinators, Lady Health Workers/Lady Health Volunteers, polio workers, community-based volunteers), district administration, media, medical associations, revenue department, education department social activists, community leaders/influencers, and community-based organisations.

The current efforts to eradicate polio in Pakistan are part of the Global Polio Eradication Initiative (GPEI) End Game Strategy-2023. Under the current strategy, the government of Pakistan has engaged local health, administrative staff, and police stations who have more influence at the community level for better implementation of the End Game Strategy. Civil society, local influencers, celebrities, religious leaders, and frontline workers were involved in the most recent polio vaccination campaign in December 2021. Evidence from the authors' experience in vaccination campaigns indicates that these trusted local stakeholders' participation encouraged community acceptance of the vaccine; they should continue to be engaged in the future.[21]

Recent developments in polio vaccination in Pakistan

Recent environmental surveillance activities have detected high levels of polio in samples from the tribal region and some parts of the settled areas. GPEI and the Ministry of Health continue to struggle to engage with local authorities Super High-Risk Areas, while current beliefs about polio vaccination also pose challenges. For example, some ethnic Pashtun communities believe that polio is a genetic problem and that once children start walking, or are more than one year old, the disease cannot harm them. Others believe that polio infection and its consequences are a matter of fate and cannot be prevented.

These dynamics underpin recent cases:

- On 27th January 2021, a case was identified in Killa Abdullah Baluchistan after the area was 15 months polio-free.
- On 22nd April 2022 a confirmed positive case of WPV Type-1 was identified leaving a 15-month old boy paralysed in the Mir Ali Tehsil of district North Waziristan.[22]

- On 30th April 2022, another confirmed case in the same district was identified, leaving a 2 year-old girl paralysed.[23]

Subsequently, in the same tribal region of North Waziristan, Mir Ali Tehsil, four more cases have been identified, raising the total number of WPV to six in just a period of five weeks.[24]

BARRIERS FACING POLIO VACCINATION CAMPAIGNS

Despite great progress made by Pakistan in reducing the number of polio cases, there are still many factors that can hinder polio eradication. The government has made efforts to increase access to vaccines and improve awareness; however, beliefs, practices, and cultural norms sometimes overshadow public health priorities and lead to vaccine refusal.[25] Some of the reasons given by caregivers for refusing the vaccine include perceived side effects, beliefs that healthcare workers are not vaccinating their own children, dangerous and *haram* (i.e. strictly not allowed to consume something in Islam) ingredients, adverse effects in terms of infertility or puberty, and questions over why our ancestors never got vaccinated.[26,27]

Political context and mobilisations

The tribal regions of Pakistan have faced long-standing political, social, and economic marginalisation.[28,29] Communities in the region are using the refusal of vaccination as a tool for leverage, in response to perceived marginalization by the federal government. Tribal people have engaged in a fight for their rights and for an equitable share in the budget allocated for the socio-economic development of the region. Tribal elders and *maliks* feel that they have been marginalised during distribution of federal funds for regional development, and lower funding contributes to lower economic development.

Tribal communities have mobilised around these issues. Their main demands are for electricity, roads and infrastructure, basic health facilities, distribution of free food items, mosquito nets, and removal of police charges against tribesmen. They have organised protests to highlight their demands to the federal government. However, they have also engaged in tactical boycotts of polio campaigns on a mass level.[30] These boycotts have been successful, such when the government resolved local land and water distribution disputes after tribal leaders led a boycott of polio vaccination campaigns.

Given this context, polio eradication efforts are often a ‘battleground’ for wider political issues. As such, security concerns drive vaccine refusal in the region. The tribal region has been a conflict-affected and insecure zone for almost two decades and front line workers (FLWs) feel reluctant to participate in immunisation campaigns due to threats to their lives, often across the entire region.[31] In addition, the Pakistani army has blocked main roads to villages and other tribal communities who are living near Pakistan-Afghan border. In March 2021, more than 6,000 caregivers refused polio vaccination from Tirah Bazar, Tribal District, Khyber. They have requested a main road in the Sarsobay area, which is blocked by the army and has made transport and access to communities more difficult. The issue still needs to be resolved and as such, the number of refusals grows with every polio immunisation campaign. Another major challenge in tribal areas is that whenever a First Information Report is registered for police charges against a suspected criminal, the whole community may then boycott polio campaigns to advocate for the person charged. Many tribal people believe they have no other choice but to force the government to fulfil their demands.

Misconceptions regarding vaccine safety

Misconceptions about vaccine safety also inhibit acceptance of immunisation. One specific concern arises out of an incident during National Immunisation Drives.[32–34] In April 2019, the age group for vaccination was extended and children under 10 also received OPV.[35] During polio vaccination in the Badabher area of the Frontier Region Peshawar, hundreds of children experienced abdominal pain, vomiting, and fainting and were moved for medical care to a nearby hospital.[36,37] People already had questions and misgivings about polio drops, fears which were heightened by this incident. The

community argued that now NGOs are targeting young children. In response, protesters burned a local basic health facility, which caused law enforcement agencies to take strong action against those involved.[38] The incident spread quickly through social media and within hours people across the country perceived that the vaccine was not safe. Vaccine refusals increased dramatically during the next monthly polio vaccination campaign in KPK, with 45,000 children going unvaccinated.[39,40] This resulted in 144 wild polio cases in the same year after only 12 cases in 2018.[41]

Box 3. Perceptions of 'forced vaccination' by district administrators and local police

Arrests during polio vaccination campaigns have eroded trust between front-line workers (FLWs) and tribal communities. After the Badabher incident in April 2019, the Deputy Commissioner of Peshawar attempted to coerce caregivers into vaccination their children. Caregivers who refused had their doors broken in, were arrested, and released only upon signing a surety bond in the presence of two witnesses. In response, the arrested caregivers declared that the Deputy Commissioner 'will face the consequences of smashing our doors and stepping inside our houses, ruining our honour and integrity among the community. He should know that Pashtun people never compromise on their honour and disgrace.' Later, the community decided to favour those who were arrested, and in protest forbid polio staff and other immunisation FLWs to enter the community.[42]

Social, gender, and cultural barriers to polio vaccination

The area is also considered to be the oldest male-dominated society in the country, persisting for centuries. Tribal women are often not permitted to get an education or make decisions about who they marry, when they have children, or whether to vaccinate their children. Some Muslim clerics in the region justified this approach through teachings in the Quran, which discusses the 'superior' physical and financial ability of men that always surpasses the female role in religious settings.

In some parts of the country, upper caste communities may not accept a lower caste polio worker to visit their children for vaccination.

No female field workers: currently a core issue in the tribal areas is the availability of female staff to work on vaccination efforts. Female vaccinators are an integral part of polio campaigns, but tribal culture does not allow women to work outside their houses, particularly for NGOs. It is impossible to vaccinate children of a house without any female staff, as the tribal culture does not allow men to knock on the door if the male member of the house is not at home (and if it happens then women of the house never answer to the door). Further, no health staff could ask any male about a pregnant female in the community. This would be considered extremely unethical and unsocial, which would jeopardize the safety of health staff. When a child is born, routine immunisation staff may find out through local community members, but it is very hard to keep track of pregnant women or newborns in the area.

Religious factors

The rich historic culture of the tribal region is also insular. These beliefs are most common in some parts of the Khyber Pakhtunkhwa province (KPK), as well as in Karachi city in the Sindh region amongst migrant Afghan populations from tribal areas and KPK. Leaders rarely accept interference from outside their territorial limits, which would harm their traditional values and most importantly, religious beliefs. Such intervention is always resisted by the local tribesmen with 'traditional' gun culture. The same approach is being followed during immunisation campaigns by the elder tribesmen who consider vaccination as unnecessary 'foreign intervention' into their community. Tribal people consider their ancestral traditions as part of their culture and rarely accept change or perceived harm to their cultural norms. Vaccination without illness is another key issue, as many perceive vaccination as unnecessary when fathers and elders never used it. There is the perception that these vaccinations brought all these diseases and that's why we want to stay away from it.[42]

Many people in Pakistan do not allow any action or speech against Islam. It is quite clear that no other religion exists in the tribal region, but only 'Islam,' which has given an edge to the religious leaders of the region to be more dominant in implementing religious values and rules. Tribal people

have an aggressive approach for anti-Muslims and never compromise on taking prompt actions against any outside religious intervention to secure their religious integrity. They also think that foreign funding, whether it's local development, free medicine, or vaccination, is considered un-Islamic and *haram*. Strong religious beliefs typically lead to a rejection of foreign aid.

Many across the tribal areas believe that the polio vaccine is unsafe because of the misconception that they contain *haram* ingredients, including pig sperm or blood or monkey faecal matter. Some say that the vaccine causes sterility, while other caregivers argue that it also causes early onset of puberty. Some tribal peoples consider it as un-Islamic (i.e. not acceptable practice) and *haram* for their children and do not allow their children to be vaccinated.[43] Others refuse it because they feel the western world is promoting their own western agenda in Muslim communities.[44] Indeed, in rural tribal areas communities have experienced a self-governed society for centuries and any involvement from Western countries, for example through free vaccination, has been perceived very negatively.[45]

It has been observed during field visits that many of the male caregivers were influenced by the local religious leaders who perform at their Islamic gatherings and congregational prayers. These religious influencers announce during formal religious gatherings or funeral ceremonies that if people vaccinate their children, then do not contact us for further religious activities. Religious leaders' influence and opinions (which tribal people strongly comply with) always affect the vaccination campaigns negatively. The involvement of local administration or police have made the situation more critical through forced vaccination.[42]

Key practical and logistical barriers

Beyond the political, social, religious and cultural issues above, there are a variety of other practical barriers to vaccination. These include the following:

Fake finger marking: Vaccination staff mark children's fingers after administration of the vaccine. However, caregivers who refuse vaccination began to mark the children's fingers themselves. In response, the vaccination programme now marks different fingers and uses different coloured markers for each campaign. This has led to caregivers threatening FLWs and demanding that FLWs mark the children's finger but not vaccinate them. They also sometimes force FLWs to empty the vaccine vial on the ground and mark the child's finger. Caregivers sometimes threaten the FLWs' lives if they report these acts.

Cold chain issues: There is a lack of proper management of the vaccine cold chain in tribal and remote areas, so there could be a decrease in efficacy which requires more understanding of how to maintain the cold chain.

Staffing issues: Polio vaccination campaigns have insufficient permanent staff and must therefore hire temporary staff on a daily basis. This leads to high turnover, which in turn means less-experienced campaign staff and an increased training burden for management. Inexperienced staff have also made the immunisation programme slower. Ten to twenty percent of children who have received their first dose of Polio were deprived of their 2nd and 3rd dose because of poor performance of Expanded Programme on Immunisation (EPI) and a lack of information about immunisation.[46] Temporary workers may also be less motivated because of transportation and logistical issues, and delays in staff payments. Most of the staff is hired through a daily wage system which leads to insecurity about the job and wage payments.[47]

COVID-19: The COVID-19 pandemic posed new challenges and interruption to vaccination, requiring the programme to swiftly and continuously adjust to meet targets and ensure the safety of FLWs and the community. The programme is focused on high-risk areas, i.e. the core reservoirs of Central Pakistan and south KPK, including tribal areas attached with Pakistan-Afghanistan border. The programme is continuously re-defining its geographic focus to ensure interruption of polio transmission.[20,48]

CONSIDERATIONS FOR IMPROVING LOCALISATION EFFORTS

Vaccine resistance is being addressed successfully in some settled areas through innovative approaches tailored to the community context. These include deploying evening vaccination teams, health camps, tracking missed and unavailable children, addressing refusals before the campaign starts and engaging pro-vaccination influencers. However, more actions and innovative approaches are needed to mitigate vaccine resistance more broadly through 'localisation' efforts (i.e. tailoring to local context and increased local ownership).[49] Without consideration of the specific tribal area context, the programme will likely continue to fall short of key polio eradication goals.

Social Mobilisation: Politicisation of the program, socio-cultural context, inadequate awareness of polio, and understanding of the importance of vaccination are major challenges to vaccination campaigns. To address this, social mobilisation is critical at a household level and among local stakeholders and leaders. Current approaches include awareness-raising outreach and mass awareness campaigns conducted by polio workers on regular basis. Community support groups and rural support groups have been locally formed and trained to support awareness-raising programmes and vaccination campaigns in their areas.

School sessions: Polio workers can conduct additional awareness sessions at schools, involving both teachers and students. These sessions, conducted mainly when polio vaccination campaigns are ongoing, are very useful in urban areas. However, they are less productive in rural areas, such as the villages of Sindh and Baluchistan and tribal regions where there are either no schools or few that are functional.

Improving local ownership through influencers: 'Influencers' have been targeted and involved in polio campaigns to increase acceptance. These may include political leaders, religious leaders, tribal leaders, heads of the families and other respected persons in a given locality. Volunteer religious support persons (RSPs) from the local community have also been attached to each campaign; however, vaccine-refusing caregivers consider these RSPs to have been bought by NGOs and often don't trust them.

Building trust beyond polio eradication efforts: A focus on polio vaccination to the detriment of other health and social issues has been cited widely as a driver of resistance.[50] To build trust, it is imperative that vaccination workers work cooperatively and collaboratively with local stakeholders, when possible, to identify and tackle other health and social needs. This could include a focus on addressing basic needs that are also environmental sources of polio. For example, amelioration of basic health facilities, supply of clean drinking water and proper sanitation system should be developed in order to build community's trust as well as control further spread.

Rapid ethnographic assessment: A rapid ethnographic assessment could be considered as a key tool in the context of tribal areas for collecting evidence-based information, identifying major loopholes and addressing those in such a way that would best fit for making progress to the immunisation programme and provision of other basic health needs in future.[2] Before such contextual appraisal the key stakeholder would be identified and later be involved in order to know the crux of tribal society for further implementation of the tool.

Restoration of the local *Jirga* system: tribal people strongly believe that their internal matters could only be solved through their traditional *Jirga* system and there is no need from any other party from outside to get involved. Currently, the communication staff is struggling hard to overcome refusals through the *Jirga* system, as the political merger of FATA has completely changed the structure of this system, and it is not working well in its current form. Local representation of trusted people among community and further involvement of the local leaders and religious influencers could solve community problems and contribute to an upward trend in immunisation.[51]

The involvement of people through local *Jirga* system would help further for structuring meaningful plans to gear-up polio eradication programme.[52] Social scientists and humanitarian practitioners have come up with a key solution to the vaccine resistance in tribal and remote areas. This is to improve the involvement of local people, including religious leaders. The same phenomenon has been adopted by Nigeria public health practitioners to overcome vaccine 'hesitancy' and has finally

succeeded recently after decades of struggle.[53] The same situation is facing the tribal areas of Pakistan, which is more critical due to the increased cross-border movement with Afghanistan. It is important that the polio eradication programme reflect and adapt to the local value system of a particular area. Practically, in order to gain trust of the local elders, the programme should consider rewards and gifts for the elders of the community at the end of major awareness sessions through *Jirga* systems.

Preferred communication channels: We need additional research to analyse preferred communication channels for information and awareness, beyond religious persons, which we know to be one effective communication channel. The involvement of masjid (place of prayer) imams, madrassa (religious school) teachers and other local trusted religious persons should be involved to make announcements during religious events and congregational prayers. Messages through these channels would make more sense as these are more trusted than any other ways of communication in tribal areas.

Social media is potentially one platform to raise awareness in limited time and reaching huge of audiences, but unfortunately it is not used effectively for the polio vaccine campaigns. Furthermore, local influencers can be used to target particular locations to reach people where there are more refusals or number of cases.

Permanent trained human resources: There is permanent staff for polio campaigns, but this is not sufficient during polio campaigns. For each campaign, the health department recruits temporary staff on daily wages who implement activities after a short training. Because of high turn-over in temporary staff, staff skills and experience lag. There should be enough skilled permanent staff to be used in campaigns and routine immunisation services, even if the country receives a polio free certificate. In that case, the country would need staff and regular monitoring systems in order to control further spread.

Resources for the field staff: Currently there is no transportation, no fuel charge reimbursement, and no motor bike provision in far flung and remote areas. For the field staff motivation there should be enough resources provided including transportation, trainings/refresher, stationary, IEC materials, protective equipment, refreshment, and additional incentives/cost reimbursement during campaigns.

Having programmatic, system-wide, socio-cultural and of course ethical dimensions, the policy makers and programme managers in Pakistan must attempt to address the multitude of challenges to polio vaccination, whereby the plan of action developed within the ethical norms could potentially lead to an ultimate success.[25]

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