TABADLAB
CENTRE FOR PUBLIC HEALTH (CPH)

FIRST RESPONSE

August 24, 2022

Polio-free Pakistan: The Challenge of High-Risk Districts

Ali Saood
Zeeshan Salahuddin

- As of August 23, 2022, after more than a year of no cases in Pakistan, 14 cases of wild poliovirus have been detected in southern Khyber Pakhtunkhwa (KP).
- Pakistan's Polio Eradication Programme has scaled up remarkably well, and thus contained the virus from spreading. However, it continues to exist and circulate through six high-risk districts in southern KP. These areas have unique challenges in terms of insecurity, post-conflict rebuilding, administrative flux, and the Tochi River acting as a connection of water channels from Afghanistan to Pakistan's Indus River.
- These challenges will require novel approaches to permanently interrupt the circulation of wild poliovirus in Pakistan. This can be done through enhancing the public service ecosystem for vulnerable communities, making immunisation a priority point in the TTP negotiations, structurally recalibrating the polio eradication programme to increase worker motivations and synergise with other health interventions, and leveraging technologies for better access and microplanning.

1. Background and Context

Over the past decade, Pakistan has made tremendous progress in controlling the spread of wild poliovirus. In 2021, only one case was detected – the lowest number of annual cases ever reported.[1] With no new cases detected for twelve consecutive months (a full calendar year), by January 2022 optimism began to build around polio frontline workers, management teams, and the wider public – capped by the Bill Gates' visit to Pakistan in February 2022. However, many experts (including Gates) also warned of the need to enhance vigilance as the poliovirus continued to be present in the environment.[2]

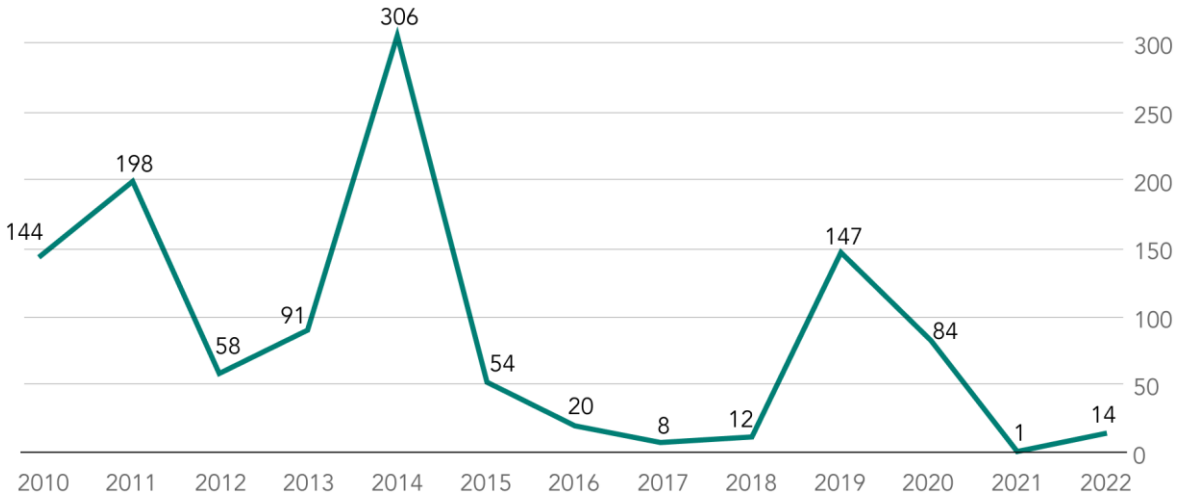
After fifteen months without a case of polio, Pakistan has reported fourteen new cases of wild poliovirus infections this year as of August 23, 2022. All the reported cases have been in southern Khyber Pakhtunkhwa (KP), with thirteen in North Waziristan and one in Lakki Marwat, between April 22, 2022 and July 28, 2022.[3] These reports have once again highlighted the urgency and importance of tailoring Pakistan's polio programme approach and delivery for the unique challenges faced by the people of the Newly Merged Districts (NMDs) and adjoining areas in KP.

1.1. How Will Pakistan be Declared Polio-free?

The last region to be declared polio-free was Africa in 2020,[4] leaving Pakistan and Afghanistan the only two countries in the world where wild poliovirus is still endemic.[5] The requirement for a country to be declared polio-free is to have 36 consecutive months without any cases.[6]

Pakistan has seen a dip in cases three times in the past decade, as depicted below.[7] [8] [9] [10] However, complacency[11] and challenges like vaccination bans, rumours, conspiracy theories, and insecurity[12] derail momentum.

Polio Cases in Pakistan



Polio eradication efforts globally have generated evidence on how to tackle a wide spectrum of geographical, ethnic, topographical, religious, and social challenges in different contexts. While these challenges are relevant to Pakistan, there exist unique sub-conditions specific to the southern KP region (bordering Afghanistan) which have disrupted polio eradication efforts. This set of distinct local challenges – like precarious lived experiences of vulnerable communities, political instability, disenfranchisement, terrorism and insurgency, displacement, and proximity to Afghanistan – require novel approaches.

2. Programme Management and Pakistan's Progress

Pakistan's polio programme has performed remarkably since its inception. Over the past decade, Pakistan's polio eradication efforts have undergone various programmatic and systematic changes, making the programme more robust, effective, and efficient. Of the 160 districts in Pakistan, cases have been reported in only two. Even in these two districts – which have over 177 neighbourhood and village councils[13] (the lowest administrative level of governance in Pakistan) – there are less than ten councils in which the wild poliovirus has infected children.

The GPEI[1] spearheads the cause worldwide, while the Pakistan Polio Eradication Programme (PPEI) works in tandem to lead and implement the programme domestically. The analysis below seeks to explore the management and functions of the efforts to end polio in Pakistan.

2.1. Pakistan

Pakistan has made significant progress since it declared polio a 'public health emergency' in 2011. At the federal level, the National Task Force (NTF) for Polio Eradication is headed by the Prime Minister of Pakistan. The National Polio Management Team (NPMT) manages the Pakistan Polio Eradication Initiative (PPEI), and the National Emergency Operations Centre (NEOC) works as the technical arm of the NTF and serves as the 'secretariat' or clearinghouse mechanism for the polio emergency.

---

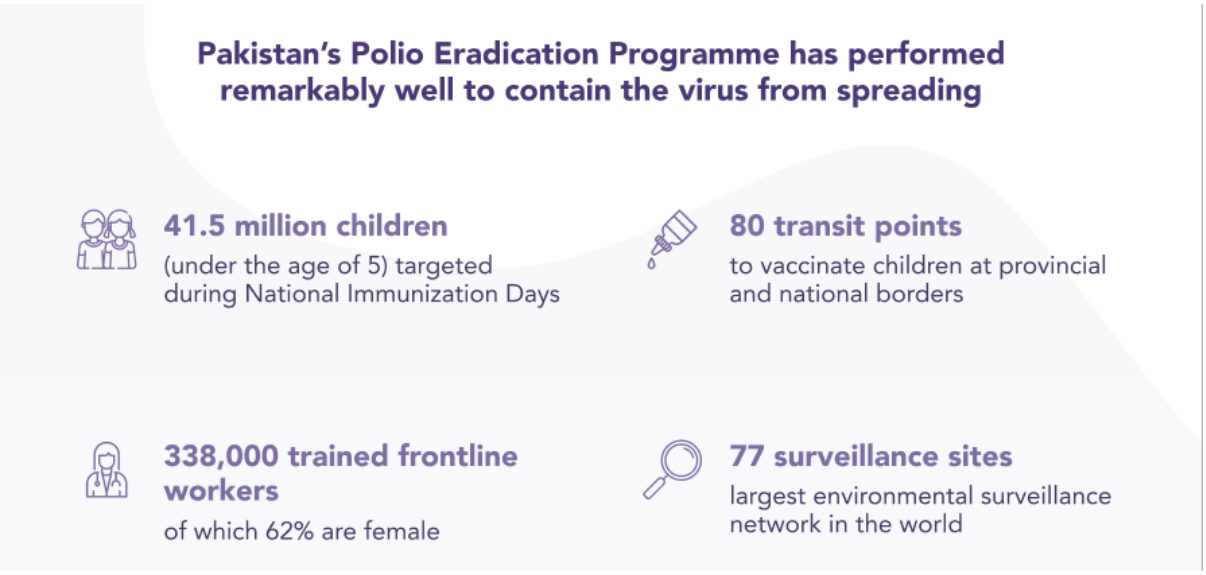
[1] It is a public-private partnership led by national governments with six partners – the World Health Organization (WHO), Rotary International, the US Center for Disease Control and Prevention (CDC), the United Nations Children's Fund (UNICEF), the Bill & Melinda Gates Foundation (BMGF) and Gavi. https://polioeradication.org/who-we-are/

GPEI's work is guided by its global strategies to contain and eliminate the poliovirus – the most recent being the Polio Eradication Strategy 2022-2026. These strategies are informed by reports from an Independent Monitoring Board (IMB), and consultative processes with all major stakeholders (implementation partners, donors, national and subnational governments).

The management is further devolved, first to Provincial Emergency Operations Centres (PEOCs), and more granularly to districts and UCs with District Emergency Operations Centres (DEOCs) and Union Council Polio Eradication Committees (UCPECs).[14]

2.1.1 Merits of Pakistan's Polio Programme

The management and action plans have resulted in various structural and systematic efficiencies in Pakistan's Polio Eradication Programme. These have given Pakistan a fighting chance and brought it closer to eradicating polio from the country. Some of these are as following.[15] [16] [17] [18]



2.1.2 National Emergency Action Plan 2020

Pakistan's polio programme is steered by periodic 'National Emergency Action Plans' (NEAP). The NEAP 2020 formulated new approaches that increased focus on communications to address community resistance and generate vaccine demand; built synergies with expanded services of immunisation, health, nutrition, and WASH services; modified schedule, structure, and spacing of Supplementary Immunization Activities (SIAs) to address frontline worker fatigue; and introduced Super High-risk Union Councils (SHRUCs) to refocus frontline efforts for maximum impact.[19]

This helped the programme achieve better results, but some issues identified in the NEAP 2020 persist, such as[20]:

- lack of trust
- public risk perception
- identifying and characterising unreached population clusters
- persistent transmission throughout the Pakistan-Afghanistan epidemiologic block
- interrupting poliovirus circulation, especially in KP
- sustaining motivation and commitment to a long-running programme

2.1.3 National Emergency Action Plan 2021-2023

The NEAP 2021-23 is derived from the priorities and objectives set forth by GPEI's Polio Eradication Strategy 2022-2026. This latest iteration of the NEAP prioritises the following[21]:

1. strong government commitment and oversight
2. proficient and empowered district teams
3. risk assessment, programme monitoring, and 'Data for Action'
4. reaching missed children
5. certification level surveillance
6. outbreak preparedness and response
7. targeted risk-based interventions

While the solutions undertaken through NEAP 2020 worked throughout the country, they demonstrated sub-optimal effect in the southern KP context. Moreover, NEAP 2021-2023 brought additional layers to the actions promulgated in NEAP 2020, bringing Pakistan down to zero cases for fifteen months. However, these changes are falling short given the re-emergence of poliovirus in 2022. The next section elaborates on the common challenges of Pakistan and the nuances of these issues in NMDs in general and southern KP in specific.

3. Challenges

To permanently interrupt all poliovirus transmission in Pakistan, it is imperative to reach and vaccinate every child. 'Missed children' and 'refusal' by caregivers form the primary reasons for subpar vaccination levels. However, as described in the figure below, these are symptoms of wider challenges persistent throughout the country.

Implementation of the NEAP 2020 largely addressed these issues in most areas of Pakistan through improved governance structures of the programme, enhanced systems of communications, data collection and monitoring, and amplified effectiveness of frontline delivery. However, the challenges of the 'last mile' have specific intricacies which are unique to regions with a heightened risk of polio.

Currently, there are six districts with the highest risk of wild poliovirus circulation – North and South Waziristan, Dera Ismail Khan, Bannu, Tank, and Lakki Marwat – all in southern Khyber Pakhtunkhwa.[22] While the polio programme has done tremendously well in limiting the spread and circulation of the virus, it is facing a different layer of localised challenges in the focused high-risk areas. The broader challenges of polio worker motivation, security, displacement, mistrust, low public facility provision, and misinformed reservations from the community [23] [24] [25] [26] [27] remain the same in southern KP, but with additional historic, political, and economic complexities specific to the region. Without addressing these specific localised challenges, Pakistan will continue to be at risk of seeing a re-emergence of polio cases.

The challenges of these high-risk districts can distinctly be divided into four categories as discussed below:

3.1. Precarious Lived Experience of the Local People

To understand the motivations and reservations of the local people and their disillusionment with governing institutions, it is important to evaluate their historically fractured relationship with the state.

- **Poor Development Indicators:** The people belonging to these districts, especially the NMDs, have long experienced inadequate public service delivery, lagging by decades of development due to historic neglect and divorce from the centre, the Frontier Crimes Regulation (FCR), and instability. The people's dissatisfaction with the public sector and governance systems stems from the region's backward state of health, education, infrastructure, energy, and technology. Health indicators are specifically worse in the NMDs with 37.1% children 'not vaccinated' against any disease, despite the national average being 5.9%.[28] Furthermore, there is a 48.3% 'prevalence of stunting' of children in the region. [29] Only 57.9% of households in the NMDs are using 'improved sanitation facilities' and only 24.2% of children's last stool was disposed of safely – the lowest rate of any region in Pakistan.[30]
- **Displacement:** The region has witnessed multiple military operations conducted by the Pakistan Army against non-state violent actors. The fallout caused damages to people's homes and displaced many, creating an Internally Displaced Persons (IDP) crisis for Pakistan. In 2009, there were reportedly 1.4 million people displaced from the NMDs[31] and more recently, 500,000 people were displaced in North Waziristan during Operation Zarb-e-Azb.[32] The displacement is not uniform or well-tracked, and in many cases, is ill-managed, affecting both cross-contamination and access.
- **Unfulfilled Promises:** Since the end of the operation and the government's repatriation programme, many are still waiting to be compensated for the damages that they faced during the military operations. These unfulfilled promises, lack of development, and general disenfranchisement of the NMDs has also been highlighted by political parties on various

occasions[33] and continue to cause friction and resentment in the relationship between the state and these vulnerable communities.

Given the context described above, the lack of trust from local people in the high-risk districts, and scepticism for any public sector intervention or campaign, increases challenges and guardedness for the polio programme's vaccination drives.

3.2. Shifts in Governance and Changing Authorities

The six high-risk districts for polio have seen various shifts in governance, planned and unplanned.

- Some of these districts were most affected by terrorism and militarised combat during the 'War on Terror'
- With the 25th Constitutional Amendment, the NMDs became a part of the KP province – however, complete ownership and accountability of these districts has remained a contested topic between the federal and provincial governments
- After the Taliban takeover of Afghanistan on August 15, 2021, Pakistan witnessed a deteriorating security situation in the NMDs, and a re-emergence of violent non-state groups and actors, as well as heightened political and security turmoil
- The region has historically been inhabited by various tribes whose leaders have tremendous social capital, and are influential in managing the political, judicial, and economic systems within the tribes

Given the evolving security and political environment of the region, the local people have constantly been in a state of uncertainty. Their lived experiences drastically vary as the governance, political approach, and military actions change. Moreover, under these circumstances, the management of Pakistan's polio programme struggles to keep processes and monitoring aligned – the operations, from the PEOC, down to the DEOC and field teams are hampered as each power shift may bring new rules and SOPs for the programme. For example, in 2012, local leaders placed a ban on polio vaccinations, demanding a moratorium on drone strikes.[34]

3.3. Instability in the Region

The ramifications of local developments and international or regional interventions lead to local instability, exacerbating challenges of security and accessibility in these high-risk districts.

- Given the nature of the poliovirus, efforts to eradicate polio from Pakistan have been, and will continue to be, affected by neighbouring Afghanistan – analysis of data has shown that the two countries are one epidemiological block.[35] The interruption of poliovirus circulation must be simultaneous in both countries. Afghanistan and Pakistan have, therefore, tried to synchronize their vaccination campaigns[36] and continue to establish and maintain vaccination sites at transit points and border crossing between the countries.[37]
    - In the past, the Taliban have stopped door-to-door immunisation and only permitted immunisations through mosques in Afghanistan,[38] hampering eradication efforts. Consequently, due to interlinkages between Pakistan and Afghanistan, spread in Afghanistan immensely increases risks for Pakistan.
- Furthermore, regional shifts affect both countries e.g. the recent US withdrawal from Afghanistan also had spill over consequences for Pakistan's polio eradication efforts. As extremist narratives and threats of violence increased with Tehrik-i-Taliban Pakistan (TTP) in Waziristan, polio workers and political stakeholders were targeted and killed.[39] [40] This has been a sustained challenge, as more than 70 polio workers – mostly in KP – have been killed in attacks by terror groups since 2012.[41]
    - The fickle security environment causes the door-to-door immunisation activities to be rushed, with teams not spending more than fifteen minutes in an area due to lack of protection and time.[42] This hasty approach and constant threat of an attack means rapid movement of vaccination teams and minimum facetime with parents or caregivers, resulting in the disruption of campaigns and missed children.

Country-wide challenges to vaccination

1 Missed Children

- Misreporting
- Demotivated polio workers
- Attacks on polio workers

2 Vaccine Refusals

- Misinformation
- Vaccination fatigue
- Inadequate access to healthcare facilities
- Religious sentiments
- Mistrust
- Mobile Populations

How were these challenges addressed nationally?

- Improved governance structures
- Enhanced and effective systems
- Amplified frontline delivery

Why was it not enough for the current high-risk districts?

1 Precarious lived experience

- Lag in development
- Limited access to public services and facilities
- Military operations against terrorist activities
- Forced displacement
- Unfulfilled promises

2 Shifts in governance and changing authorities

- Insurgency
- Federal/Provincial lack of ownership
- Violent non-state actors
- Tribal leaders

3 Regional instability

- Global interventions
- Security threat to polio workers

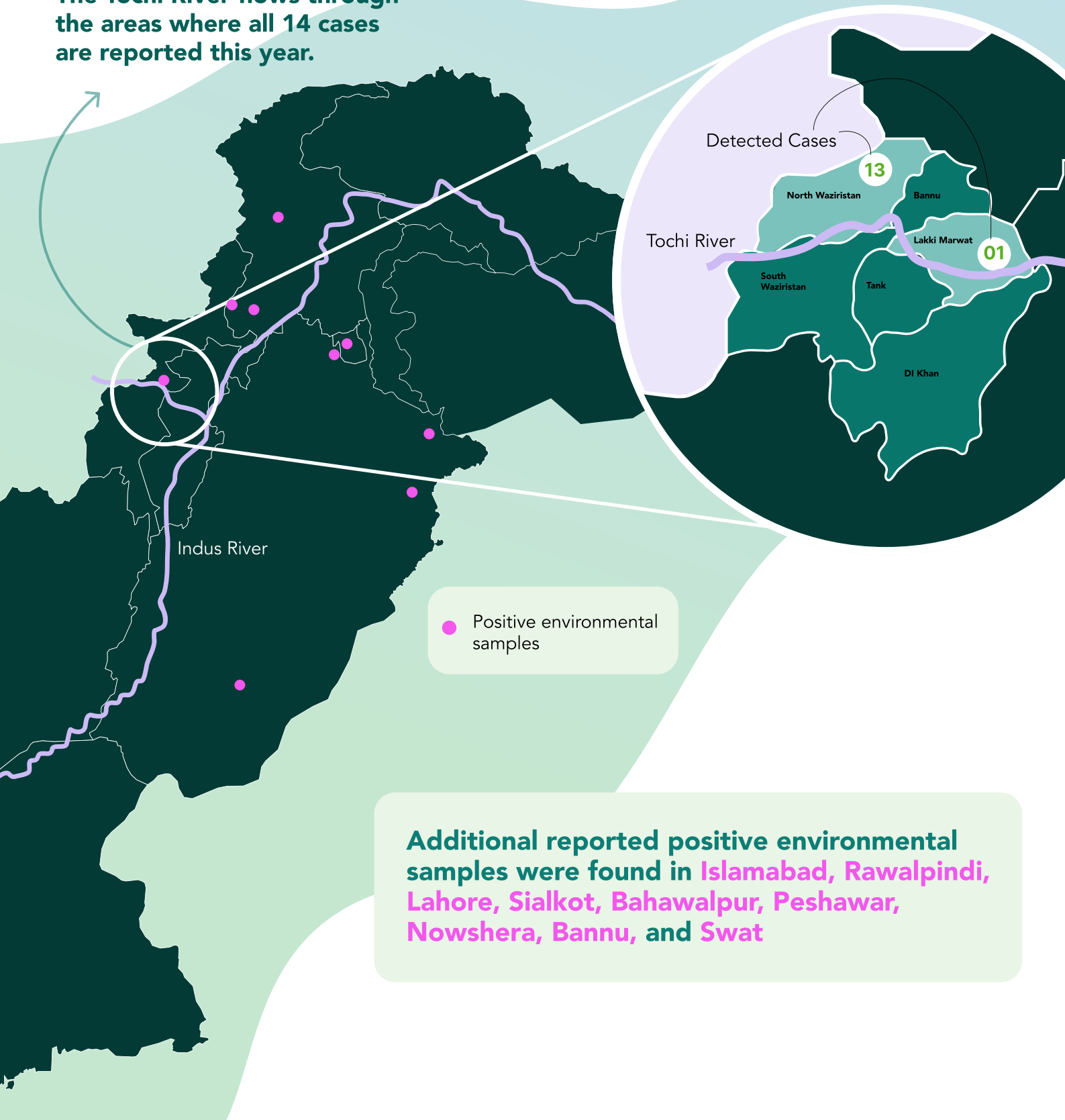
4 The Tochi river

- Contributes to the spread of poliovirus across Paktika (AFG) and South KP (PAK)

TABADLAB

After 15 months of no cases in Pakistan, 14 cases of wild poliovirus have been detected in southern Khyber Pakhtunkhwa in 2022 so far.

The Tochi River flows through the areas where all 14 cases are reported this year.



Additional reported positive environmental samples were found in Islamabad, Rawalpindi, Lahore, Sialkot, Bahawalpur, Peshawar, Nowshera, Bannu, and Swat

3.4. Tochi River

Notably, the Tochi River flows through the areas where all fourteen reported cases emerged this year. The river's water enters Pakistan from Afghanistan's Paktika province (where Afghanistan's only case of 2022 was detected in January).[43] The Tochi, after passing through North Waziristan, Bannu, and Lakki Marwat, eventually joins the Indus River, which flows through Pakistan's geographical length and connects all its major rivers. Poliovirus is known to circulate through water channels in the environment and can thus spread via this water connectivity. Therefore, it is critical to interrupt the circulation of wild poliovirus at Tochi River.

Currently, Pakistan has only reported cases in southern KP, but has already seen a spread of the virus through sample testing in nine other major cities of the country, with positive environmental samples recently reported in Islamabad, Lahore, Rawalpindi, Peshawar, Bannu, Nowshera, Swat, Bahawalpur and Sialkot.[44] Furthermore, the latest Independent Monitoring Board (IMB) report highlighted serious performance failures in the January 2022 subnational campaigns of Karachi and Balochistan.[45]

4. Recommendations

Pakistan, with the assistance of donors, bilateral engagements, and multilaterals, has established an efficient and robust programme to eradicate polio. This programme has given Pakistan more than a year of zero cases – a milestone in itself – and contained the virus to a small geographical cluster.

However, to get past the finish line and eliminate polio from the country, refocusing and adjustment is required to streamline Pakistan's polio eradication efforts and tackle the challenges of the last mile. The following recommendations offer localised solutions while staying embedded in the priorities put forward by GPEI's latest Polio Eradication Strategy 2022-2026.

1. **Enhancing the quality of the ecosystem for vulnerable communities through engagement in SHRUCs with a focus on champions, incentives, and trust:**
    a. Identify and establish champions at the grassroots such as tribal leaders, politicians, and activists. Leverage the stature and social capital of community leaders to mobilise more support for GPEI strategy vectors such as gender-sensitive ethnography, demography, and greater health system participation.
    b. Incentivise vulnerable communities by improving public service delivery (in priority sectors other than immunisation) based on insights from UNDP's MAGP[2]. This entails motivating communities and local leaders to support unhindered polio vaccination campaigns and immunisation activities, so that "context-adapted community engagement" through "Community Immunization Committees" (as per the GPEI strategy) can become a reality.[46]
    c. Establish enhanced trust within and with vulnerable communities in the process of vaccine delivery. This can be achieved by making local leaders partners in the process of vaccinating the children of their communities. This change to campaign operations can be critical in improving frontline success and strengthening cooperation.

    These initiatives will help in building confidence and reliability between all stakeholders, leading to a new era of collaboration, and repairing long fraught relations between vulnerable communities and the state. It may assist in restoring the trust of communities, elders, and local leaders in public service delivery instruments and touchpoints, thereby reducing refusals and resistance.

    This is part and parcel of the larger demand-side improvement effort.

[2] The Merged Areas Governance Project (MAGP) is a technical assistance project to transform the lives of the people of erstwhile FATA through peaceful integration with KP, the extension of civilian governance institutions, and socio-economic development.

2. **Making immunisation an integral part of wider negotiations with non-state actors:**
    a. Ensure that the facilitation of all polio and routine immunisation activities is a key element of the Pakistani state's demands during any negotiation processes with proscribed groups, especially the TTP. The eventual agreement must have the input of Pakistani immunisation experts.
    b. Leverage the Afghan Taliban's facilitative attitude for U.N. agencies' polio eradication efforts[47] to generate greater regional and local political will.

    Security and access are paramount to the polio eradication efforts and can be ensured through the inclusion of immunisation in the negotiation process.

3. **Recalibrating the Polio Eradication Programme to increase worker motivation and improve mother and child health:**
    a. Establish the frontline force (polio workers and security personnel) as the centre of gravity of the entire supply side of the polio programme by building and deepening understanding of the barriers to their performance and recognizing and rewarding their efforts.
    b. Enhance Routine Immunisation and Maternal, Newborn, and Child Health (MNCH) by utilising the impetus of polio to increase advocacy, operational mobilisation, and uptake for other health concerns, and consequently expand integration efforts and unified partnerships.

    The above mentioned adjusting and streamlining actions will be able to ensure security and access to frontline workers, motivate polio workers, have long-term ripple impacts on other health outcomes and most importantly reduce missed children.

4. **Leveraging technology to boost innovations in programme development, management, monitoring and evaluation:**
    a. Conduct an extensive two-fold study to explore existing innovative technologies for tracking and tracing, and their replicable use cases for Pakistan's polio eradication context and piloting them in the NMD context.

    These innovations could lead to enhanced detection and response through sensitive surveillance technologies, improved access, and supplemented microplanning processes, thereby reaching every child.

Ali Saood is a Policy Associate at Tabadlab. Currently, he is working on research and advisory projects focused on public and private sector engagements to improve the Public Health ecosystem. His past work experience includes policy analysis, developing institutional strategies, researching Digital Humanities Tools, and strategizing supply chains. He is interested in exploring mechanisms that mobilise private sector to achieve development outcomes. Ali holds a Master's in International Development from University of Edinburgh and Bachelor's in Business Administration from IBA Karachi.

Zeeshan Salahuddin serves as the Director for the Center for Regional and Global Connectivity (CRGC) at Tabadlab. He has worked on polio related stories and reports for nearly a decade. His research focuses on security studies, particularly religious and political extremism in Pakistan, and its priorities in an increasingly multipolar world. Previously, he was the Director Programs and Strategy at the Center for Research and Security Studies (CRSS) in Islamabad. Prior to his work in the development sector, he was a full-time broadcast journalist, having launched two national primetime channels in Pakistan. He frequently writes for The News, The Friday Times, Dawn, The Diplomat, Foreign Policy, and others, and occasionally provides analysis on BBC and Al Jazeera. He has a master's degree in Corporate Communications and Strategic Management from Ithaca College, New York.

5. Endnotes

[1] Pakistan Polio Eradication Programme. (n.d.-b). Polio Cases in Provinces. https://www.endpolio.com.pk/polioin-pakistan/polio-cases-in-provinces. Retrieved on: August 20, 2022
[2] Independent Monitoring Board. (2022). Twenty First Report: Highs and Lows in The Quest for Zero. https://polioeradication.org/wp-content/uploads/2022/05/21st-IMB-report-20220430.pdf.
[3] Pakistan Polio Eradication Programme. (n.d.-a). Polio Cases District Wise. https://www.endpolio.com.pk/polioin-pakistan/district-wise-polio-cases. Retrieved on: August 20, 2022
[4] Scherbel-Ball, N. (2020). Africa declared free of wild polio in 'milestone'. BBC. https://www.bbc.com/news/world-africa-53887947.
[5] Centers for Disease Control and Prevention. (2021). What We Do. https://www.cdc.gov/polio/what-we-do/index.htm#:~:text=Only%20two%20polio%2Dendemic%20countries,)%20remain%E2%80%94Afghanistan%20and%20Pakistan.
[6] Global Polio Eradication Initiative. (n.d.-a). Certification. https://polioeradication.org/polio-today/preparing-for-a-polio-free-world/certification/. Retrieved on: August 20, 2022
[7] Centers for Disease Control and Prevention. (2011). Progress Toward Poliomyelitis Eradication - Afghanistan and Pakistan, January 2010-September 2011. MMWR Morbidity and Mortality Weekly Report, 60(44), 1523-1527. https://www.cdc.gov/mmwr/preview/mmwrhtml/mm6044a4.htm#:~:text=In%20Pakistan%2C%20144%20WPV%20cases,%2C%20Figures%201%20and%202.
[8] Kabir, M., & Afzal, M.S. (2016). Epidemiology of polio virus infection in Pakistan and possible risk factors for its transmission. Asian Pacific Journal of Tropical Medicine, 9(11), 1044-1047. https://doi.org/10.1016/j.apjtm.2016.09.006
[9] ReliefWeb. (n.d.). Pakistan: Polio Outbreak - 2014-2017. https://reliefweb.int/disaster/ep-2014-000165-pak. Retrieved on: August 20, 2022
[10] Pakistan Polio Eradication Programme. (n.d.-b).
[11] Pakistan Polio Eradication Programme. (2017). There is no room for complacency says Senator Ayesha. Media Releases. https://www.endpolio.com.pk/media-room/media-releases/1464-there-is-no-room-for-complacency-says-senator-ayesha.
[12] Ataullahjan, A., Ahsan, H., Soofi, S., Habib, M.A. & Bhutta, Z.A. (2021). Eradicating polio in Pakistan: a systematic review of programs and policies. Expert Review of Vaccines, 20(6), 661-678. https://doi.org/10.1080/14760584.2021.1915139
[13] Local Government, Elections and Rural Development Department. (n.d.). Number of Newly Created Village/Neighborhood Councils & Union Councils. Government of Khyber Pakhtunkhwa. https://www.lgkp.gov.pk/directorate-general/vcnc/new-councils/. Retrieved on: August 23, 2022
[14] Pakistan Polio Eradication Programme. (2020). National Emergency Action Plan for Polio Eradication 2020. https://www.endpolio.com.pk/images/reports/NEAP-2020.pdf.
[15]Pakistan Polio Eradication Programme. (2022). Pakistan Polio Update. https://www.endpolio.com.pk/images/polio-briefer/Pakistan%20Polio%20Update%20January%202022%20disputed%20territory.pdf.
[16] Pakistan Polio Eradication Programme. (2022).
[17] Dr. Shahzad Baig [@CoordinatorNeoc]. (2022, July 19). We have 77 environmental surveillance sites all over #Pakistan, which means we routinely test the water in sewage drainage sites. This makes it among the largest poliovirus detection networks in the world that is being expanded to further improve precision and sensitivity. Twitter. https://twitter.com/CoordinatorNeoc/status/1549319974942031880.
[18] Dr. Shahzad Baig [@CoordinatorNeoc]. (2022, June 26). Fighting #polio is not a job we do for a few days every few months. We fight polio every day. We have over 80 transit points around the country at both provincial and national borders where thousands of people are vaccinated each month. Twitter. https://twitter.com/CoordinatorNeoc/status/1541092089047425025.
[19] Pakistan Polio Eradication Programme. (2020).
[20] Pakistan Polio Eradication Programme. (2020).
[21] Pakistan Polio Eradication Initiative. (2021). National Emergency Action Plan 2021-2023. https://polioeradication.org/wp-content/uploads/2022/02/NEAP-2021-2023.pdf.
[22] ReliefWeb. (2022). Sixth case of wild polio reported in North Waziristan. https://reliefweb.int/report/pakistan/sixth-case-wild-polio-reported-north-waziristan#:~:text=The%20southern%20districts%20of%20Khyber,highest%20risk%20of%20wild%20poliovirus.
[23] Ebrahim, Z.T. (2022). Endgame for polio in Pakistan. Dawn. https://www.dawn.com/news/1673067.
[24] Nasir, J.A., Imran, M., Zaidi, S.A.A., Rehman, N.U. (2017). Knowledge and perception about polio vaccination approval among religious leaders. Journal of Postgraduate Medical Institute, 31(1), 61-6. https://www.jpmi.org.pk/index.php/jpmi/article/download/1798/1786.
[25] Independent Monitoring Board. (2022).
[26] The Express Tribune. (2020). Over 48,000 K-P parents refuse polio vaccination. The Express Tribune. https://tribune.com.pk/story/2266122/over-48000-k-p-parents-refuse-polio-vaccination.
[27] Naveed, S. (2018). Educating girls is a must in the Newly Merged Districts of Khyber Pakhtunkhwa, Pakistan. The Brookings Institution. https://www.brookings.edu/blog/education-plus-development/2018/11/05/educating-girls-is-a-must-in-the-newly-merged-districts-of-khyber-pakhtunkhwa-pakistan/.
[28] The Aga Khan University. (2021). Third Party Verification Immunization Coverage Survey (TPVICS): Survey Report. https://www.aku.edu/coe-wch/Documents/TPVICS%20Survey%20Report.pdf#search=vaccine%20survey.
[29] Government of Pakistan & UNICEF. (2019). National Nutrition Survey 2018: Key Findings Report. https://www.unicef.org/pakistan/reports/national-nutrition-survey-2018-key-findings-report.
[30] Government of Pakistan & UNICEF. (2019).
[31] International Crisis Group. (2010). Pakistan: The Worsening IDP Crisis. International Crisis Group. https://www.crisisgroup.org/asia/south-asia/pakistan/pakistan-worsening-idp-crisis.
[32] Bitani, A. & Mohammad, N. (2020). 6 Years After Pakistani Military Operation, Some in North Waziristan Still Await Damage Surveys. VOA News. https://www.voanews.com/a/extremism-watch_6-years-after-pakistani-military-operation-some-north-waziristan-still-await-damage/6194457.html.
[33] Dawn. (2021). JI assails govt for 'ignoring' merged districts' uplift. Dawn. https://www.dawn.com/news/1630555.
[34] Ataullahjan, A., Ahsan, H., Soofi, S., Habib, A., Bhutta, Z. A. (2021). Eradicating polio in Pakistan: A systematic review of programs and policies. Expert Review of Vaccines, 1-18. https://ecommons.aku.edu/pakistan_fhs_mc_women_childhealth_wc/177.

[35] Abbas, W. (n.d.). Vaccinating Pak-Afghan border- Stepping towards a Polio free region. Pakistan Polio Eradication Programme. https://www.endpolio.com.pk/media-room/field-stories/vaccinating-pak-afghan-border-stepping-towards-a-polio-free-region. Retrieved on: August 20, 2022
[36] Ataullahjan, A., Ahsan, H., Soofi, S., Habib, A., Bhutta, Z. A. (2021).
[37] Abbas, W. (n.d.).
[38] Habibzada, M. (2019). Official: Taliban, IS Deprive Afghan Kids of Polio Vaccine. ReliefWeb. https://reliefweb.int/report/afghanistan/official-taliban-deprive-afghan-kids-polio-vaccine.
[39] The News. (2022). Three killed, one injured in attack on polio team in North Waziristan. The News. https://www.thenews.com.pk/print/970069-three-killed-one-injured-in-attack-on-polio-team-in-north-waziristan.
[40] Dawn. (2022). JUI-F activists' killing in N. Waziristan protested. Dawn. https://www.dawn.com/news/1701398.
[41] France-Presse, A. (2022). Fighting Taliban and Mistrust, Pakistan Marks One Year Polio-Free. VOA News. https://www.voanews.com/a/fighting-taliban-and-mistrust-pakistan-marks-one-year-polio-free-/6414668.html.
[42] Expert Consultation
[43] Rachlin, A., Patel, J.C., Burns, C.C., Jorba, J., Tallis, G., O'Leary, A., Wassilak, S.G.F., Vertefeuille, J.F. (2022). Progress Toward Polio Eradication — Worldwide, January 2020–April 2022. MMWR Morbidity Mortality Weekly Report 2022, 71, 650–655. http://dx.doi.org/10.15585/mmwr.mm7119a2.
[44] Bhatti, M.W. (2022). Health officials report detection of Wild Polio Virus 1 in Sialkot sewage. The News. https://www.thenews.com.pk/print/983520-health-officials-report-detection-of-wild-polio-virus-1-in-sialkot-sewage.
[45] Independent Monitoring Board. (2022).
[46] Global Polio Eradication Initiative. (2021).
[47] Dawi, A. (2022). Will Afghanistan be Polio-Free in 2022?. VOA News. https://www.voanews.com/a/will-afghanistan-be-polio-free-in-2022-/6404911.html.