

WHO PAKISTAN Polio Eradication initiative REPORT 2021-2023

ACKNOWLEDGMENT

The completion of this report was made possible thanks to the joint efforts of WHO Pakistan Communications Team and the Polio Team – under the leadership of Dr. Dapeng Luo, Dr. Zainul Abedin Khan, and Dr. Mohammed Ahmed Soghaier – and the valuable contributions of WHO technical teams working in close coordination with the NEOC, whose expertise and insights were instrumental in shaping this document. We also thank WHO colleagues and the NEOC for the images used in the report.

Overview and editing: Dr. José Ignacio Martín Galán. Coordination and writing: Ms. Suzanna Masih. Design: Mr. Hamid Inam.

TABLE OF CONTENTS

Acronyms	02
Foreword	03
WHO Pakistan Polio Response 2021-23 At a Glance	04
Executive Summary	05
Introduction: How WHO Delivers for Polio Eradication in Pakistan	07
Chapter 1: Vaccination Operations	08
1.1. Supplementary Immunization Activities (SIAs)	09
1.2. Alternate Vaccination Strategies	09
1.2.1. Comprehensive Transit Vaccination	10
1.2.2. Biker Strategy: Vaccination on Wheels	11
1.2.3. Joint Interventions by the Polio Eradication Programme and the Expanded Programme on Immunization	11
Chapter 2: Monitoring and Evaluation	12
2.1. Lot Quality Assurance Sampling (LQAS)	13
2.2. Post-Campaign Monitoring (PCM)	13
Chapter 3: Surveillance	14
3.1. Acute Flaccid Paralysis (AFP) Surveillance	15
3.2. Environmental Surveillance	15
3.3. WHO-accredited Regional Reference Lab for Polio	16
Chapter 4: New Interventions	17
4.1. Ring-fencing Vaccination	18
4.2. Nomads Vaccination Initiative	18
4.3. Search Team Outreach Plus Initiative	19
4.5. LogTags for Surveillance Quality	19
4.6. Independent Campaign Monitoring	19
Chapter 5: Gender in WHO PEI	20
Chapter 6: National Certification Committee	21
Chapter 7: The Road Ahead	22

ACRONYMS

AFP	Acute flaccid paralysis
EPI	Expanded Programme on Immunization
ES	Environmental surveillance
FIPV	Fractional inactivated polio vaccine
GPEI	Global Polio Eradication Initiative
HRMP	High-risk mobile populations
КР	Khyber Pakhtunkhwa
LQAS	Lot Quality Assurance Sampling
NCC	National Certification Committee
NEAP	National Emergency Action Plan
NEOC	National Emergency Operations Center
NIDs	National immunization days
OBRs	Outbreak response
OPV	Oral polio vaccine
РСМ	Post-campaign monitoring
PEI	Polio Eradication Initiative
PTPs	Permanent transit posts
RI	Routine immunization
RRL	Regional Reference Lab
RuR	Reaching the Unreached
SIAs	Supplementary Immunization Activities
SNIDs	Subnational immunization days
STPs	Seasonal transit posts
TAG	Technical Advisory Group
UC	Union council
VRC	Voluntary Repatriation Centers
WPV1	Wild poliovirus type 1

FOREWORD

With poliovirus confined to just two countries, ending the global threat of polio is within reach, but only if we continue to fight it with the highest urgency, sustained resources, and leadership. As one of the last two polio-endemic countries, Pakistan stands at a critical juncture to cover the last mile and become polio-free. WHO remains committed to supporting the Government of Pakistan in advancing towards the elimination of this paralytic disease, protecting millions of children not only in Pakistan, but across the world.

The 2021-23 period tested the resilience of the government-led Pakistan Polio Eradication Programme. From no cases for a historic 14-month period in 2021-22 to a largely contained outbreak in

2022, and an uptick in poliovirus detections towards the end of 2023, polio eradication efforts remained consistent, providing critical health services to the communities. When the 2022 floods emergency left one-third of the country under floodwaters, the polio workforce was leveraged to provide disease surveillance and vaccination in relief camps, highlighting the polio team's far-reaching support to overall health systems.

Throughout this period, WHO remained a crucial partner of the Government of Pakistan. WHO mobilized over 14,000 WHO-associated personnel and 400,000 vaccinators to protect millions of children from paralytic polio. We also supported Pakistan in maintaining the largest and most sensitive polio surveillance network in the world through 11,643 acute flaccid paralysis reporting sites and 118 environmental surveillance sites. In parallel, WHO partnered with the Polio Programme to strengthen routine vaccination through strategic innovations and collaboration with the Expanded Programme on Immunization.

Polio frontliners work tirelessly to overcome challenges such as limited access, population movement, gaps in health systems, misinformation, and vaccine hesitancy. I would like to convey my deepest gratitude for their vital work. They are the heart and soul of the polio response.

This report reflects the hard work of thousands of vaccinators, WHO and partner staff, campaign monitors, and government counterparts who surmounted multiple and complex difficulties throughout 2021-23 to reach and protect millions of children. It is also a testament to the leadership and commitment of the Government of Pakistan to eradicating polio, and the long-standing support of our Global Polio Eradication Initiative partners.

In the final steps toward polio eradication, WHO remains fully committed to supporting Pakistan not only to eliminate polio but also to build stronger, more resilient health systems. WHO will stand with Pakistan to take the final steps to end the global threat of polio, building a better future for millions of children.

Dr Dapeng Luo

WHO Representative in Pakistan

WHO PAKISTAN POLIO RESPONSE 2021-23 AT A GLANCE



WHO Pakistan's robust polio workforce and surveillance network:





400,000+ vaccinators mobilized for every national campaign.

14,000+ personnel deployed

11,643



acute flaccid paralysis (AFP) reporting sites and 118 environmental surveillance sites supported by WHO in 83 districts across the country - the largest and most sensitive polio surveillance network in the world.



43 M+ children vaccinated every year with the oral polio vaccine (on average).



27 house-to-hou

house-to-house oral polio vaccination campaigns supported.

10



additional campaigns to administer injectable vaccines to 4-59 months-old children in priority areas.



676 reporting sites added to the surveillance network in 2021-2023.



27 polio cases reported.

¹ Over 2.1 million children reached once, while 878,312 children in six districts of south ² Estimated overall number. An individual monitor could cover multiple campaigns.





3 M+ children vaccinated with the injectable polio vaccine.¹



679 M polio drops administered.



33,000² monitors mobilized to

monitors mobilized to assess campaign coverage and quality.



53 additional environmental surveillance sites

established.



228 positive sewage samples detected.



Despite having reduced polio cases by 99% since 1994 thanks to combined vaccination and surveillance efforts, Pakistan — together with Afghanistan — remains one of the last two countries in the world where wild polio has not yet been eradicated. Interrupting polio transmission in Pakistan remains a global priority to protect millions of children from a lifelong paralytic disease, not only in the country but across the world.

Throughout 2021-23, WHO Pakistan continued leading the largest WHO polio eradication operation globally, partnering with Pakistan to support its Polio Eradication Initiative through the implementation of 27 polio vaccination campaigns that protected over 43 million children per year and 10 additional drives targeting 3 million with the injectable polio vaccine in high-risk areas of Khyber Pakhtunkhwa, Punjab, and Sindh. WHO also supported Pakistan in maintaining the largest and most sensitive poliovirus surveillance network in the world with 11,643 acute flaccid paralysis (AFP) reporting sites and 118 environmental surveillance sites in 83 districts. This network was instrumental in detecting poliovirus circulation and guiding decision-making on outbreak response campaigns.

In parallel, WHO supported the Government in raising polio and routine vaccination coverages through the following innovative strategies to protect unreached or inaccessible children:

- **Nomads Vaccination Initiative** to deliver oral and injectable polio vaccines and routine vaccines to 472,479 and 164,777 nomadic children often missed in polio campaigns.
- **Expansive transit vaccination network** to immunize 48.4 million individuals with oral polio vaccines.
- **Collaboration with the Expanded Programme on Immunization** to identify and vaccinate zero-dose children, building immunity and increasing vaccination rates.
- **Special vaccination initiatives** during the high-travel season of Ramadan and Eid that immunized 1.6 million children at strategic points like malls, parks, zoos and other public places, engaging parents in vaccination activities and building immunity.



27 wild polio cases registered over three years

In 2021-2023, Pakistan registered 27 wild polio cases, the majority of them in endemic districts located in southern Khyber Pakhtunkhwa (KP) province, and polio core reservoirs in Karachi and Quetta block. After the detection of one polio case in early 2021, Pakistan experienced an unprecedented 14-month period of zero polio cases during 2021-22. However, sporadic detections of wild poliovirus type 1 (WPV1) in the environment persisted, culminating in 2022 in an outbreak that paralyzed 20 children in southern KP. While only six cases were reported in 2023, environmental detections saw an uptick in the second half of the year following unusual population movement patterns and an expansion in surveillance efforts that helped to swiftly detect virus circulation with these moving populations. Encouragingly, focused vaccination efforts successfully reduced WPV1 genetic clusters in circulation from four in 2021 to two in 2023, demonstrating the impact of targeted immunization on breaking transmission chains.

The expansion of the acute flaccid paralysis (AFP) surveillance network in Pakistan with the addition of 676 sites increased AFP reporting by nearly 30%, while the addition of 53 more environmental surveillance sampling sites led to a 165% increase in environmental sample collection, ensuring the detection of 27 polio cases and 228 environmental samples positive for poliovirus during this period. These detections prompted swift and targeted vaccination responses.

During the period, WHO-supported polio response faced challenges such as unusual population movements, gaps in health infrastructure, limited access to specific areas due to security concerns, and vaccine hesitancy or refusal among parents due to lack of awareness, misinformation, and disinformation.

Following recommendations by the Technical Advisory Group on Polio Eradication (TAG) in 2022, a strategic recategorization of districts into Endemic, Outbreak, Risk Reduction, and Maintenance districts prompted focused operational and surveillance interventions in endemic and core reservoir districts to ensure continued vaccination coverage of children living in the highest-risk zones.

With these strategic advancements, Pakistan is moving towards polio eradication with WHO and partners' assistance. Polio vaccines work and save lives, and every year protect up to 44 million children in Pakistan. Since 1994, the Pakistan Polio Eradication Programme has reduced the number of polio cases by more than 99%, protecting millions of children from paralytic polio thanks to combined surveillance and vaccination efforts.

WHO will continue supporting Pakistan and its partners to end the global threat of paralytic polio together, leaving no child behind.

INTRODUCTION: How who supports polio eradication in pakistan

The Global Polio Eradication Initiative (GPEI), supported by WHO as a founding partner, has leveraged since 1988 collaboration with national governments and global partners to protect millions of children across the world by supporting surveillance and mass immunization campaigns. As a result, polio cases have been reduced by 99.9% globally, two of the three wild poliovirus types have been eradicated, and over 20 million people across the world are able to walk who would otherwise have been paralyzed.

Since the launch of the Pakistan Polio Eradication Programme in 1994, WHO has partnered with the Government of Pakistan to protect millions of children from paralytic polio. As a result:



- Polio cases have been reduced by more than 99%, from an estimated 20,000 cases in 1994 to 6 cases reported in 2023.
- Two of the three wild poliovirus types have been eradicated.
- Genetic diversity of polioviruses plunged to two genetic clusters.
- Successive generations and millions of children have been protected from polio.

Despite progress, Pakistan — together with Afghanistan — is one of the last two endemic countries in the world where wild polio has not yet been eradicated.

During the period 2021-2023, WHO supported the Polio Eradication Programme led by Pakistan by providing technical expertise, operational support and guidance in polio operations to advance the National Emergency Action Plan for Polio Eradication (NEAP), in line with Goal 1 of GPEI's Global Polio Eradication Strategy 2022-2026.

To this end, WHO worked with GPEI partners as one team under the National Emergency Operations Centre (NEOC), providing support to the Government of Pakistan in the following major areas:

- **Polio operations:** Leading the planning, implementation and logistics for polio Supplementary Immunization Activities (SIAs), outbreak response activities, and alternate polio vaccination strategies, from cross-border vaccination to vaccination of high-risk mobile populations.
- **Surveillance:** Managing the establishment and maintenance of a highly sensitive poliovirus surveillance system, supported by a world-class lab, for timely detection of poliovirus circulation through acute flaccid paralysis AFP and environmental sampling.
- **Monitoring and Evaluation:** Leading the planning and implementation of quality assessments of all pre, intra and post campaign phases of polio SIAs.
- **Coordination:** Supporting collaboration and coordination between the Polio Eradication Programme and the Expanded Programme on Immunization for enhanced polio and routine immunization coverage.
- **Containment and Certification:** Supporting Pakistan's efforts to meet global certification requirements to attain polio-free status.

The following chapters outline the main activities and impact of WHO interventions in support of the Pakistan Polio Eradication Programme during the period 2021-23.



CHAPTER 1: VACCINATION OPERATIONS

Throughout 2021-2023, WHO supported the Government of Pakistan to protect an average of 43 million children per year from paralytic polio through 27 house-to-house oral polio vaccination campaigns and 10 smaller targeted campaigns providing injectable polio vaccines at fixed vaccination sites in high priority areas that immunized 3 million children. Over 400,000 vaccinators, 679 million vaccine doses and expansive logistics were mobilized throughout 2021-23 to reach children across the length and breadth of the country. These campaigns were reinforced with the vaccination of 48.5 million individuals (including children and adults) in transit and at border crossings. To ensure high immunity, polio drives were supplemented with a range of alternate vaccination strategies to cover children in mobile communities and hard-to-reach areas, aiming to leave no child behind.

KEY DATA POINTS



37 polio vaccination campaigns conducted.



3 M

children under five protected with additional doses of the injectable polio vaccine.³



221,000+ routine injectable vaccines

administered by biker teams.



43 M

children under five vaccinated with polio drops in house-to-house campaigns (on average).



400,000+

vaccinators mobilized across the country in house-to-house campaigns.



500,000+

children in nomadic communities and hard to reach areas reached with oral and injectable polio vaccines through biker teams.



48.5 M

individuals reached through transit vaccination at border crossings, train stations, bus stands, checkpoints and public places like malls and parks.⁴

³ 2.1 million children reached once, while 878,312 children in southern Khyber Pakhtunkhwa reached twice in two campaigns. ⁴ There could be duplications

1.1. SUPPLEMENTARY IMMUNIZATION ACTIVITIES (SIAS)

WHO partnered with the Government of Pakistan to lead the implementation of 27 house-to-house polio Supplementary Immunization Activities (SIAs), including nine nationwide, 10 subnational campaigns and eight outbreak response campaigns with varying vaccination targets, based on a thorough analysis of virus spread and districts at risk of transmission.

In addition to the 27 door-to-door campaigns, 10 strategic campaigns to administer fractional doses of the injectable polio vaccine reached 3,040,648 children between the ages of 4-59 months in polio high-risk areas where pockets of low routine vaccination rates also persisted. Through these campaigns, 2,162,336 children were reached once in five districts of Punjab, two districts of Sindh and one district in southern Khyber Pakhtunkhwa, while 878,312 children were reached twice in six districts of southern Khyber Pakhtunkhwa.

1.2. ALTERNATE VACCINATION STRATEGIES

In order to supplement house-to-house polio campaigns, a comprehensive transit vaccination strategy ensured the administration of the oral polio vaccine (OPV) to 48.5 million transiting individuals - including children moving within the country and children and adults crossing international land borders - to prevent the spread of poliovirus through moving populations. Additionally, to support Pakistan in increasing its vaccination coverages, WHO leveraged joint resources and expertise of the Polio Eradication Initiative and the Expanded Programme on Immunization (EPI) to deliver polio and other routine vaccines to underserved nomadic, mobile and other hard-to-reach children through innovative outreach strategies like biker teams that reached 502,933 children with oral and injectable vaccines, and administered 221,411 routine immunization injectable vaccines. WHO also provided operational and resource sharing support to EPI, strengthening routine immunization in polio high-risk areas, and facilitated the integration of polio drops in routine vaccination campaigns, reaching 34.2 million children throughout 2021-23⁵.



⁵ The children reached by these campaigns could be the same also reached by other polio drives.



1.2.1. COMPREHENSIVE TRANSIT VACCINATION

- Permanent Transit Posts (PTPs): Teams stationed year-round at fixed posts at international, interprovincial and interdistrict borders, international airports, and railway stations administered oral doses to 16.9 million individuals, including adults vaccinated at Pakistan-Afghanistan and Pakistan-Iran border crossings, to prevent the international spread of wild poliovirus.
- Special Transits Posts (STPs): Up to 1,600 teams deployed at bus stops, check posts, hospitals, and other key locations – particularly during high-travel periods like labor or seasonal migrations – vaccinated with oral doses over 28.5 million children on the move across the country to prevent the spread of virus from high-risk areas to polio-free districts.
- Ring-Fencing Strategy: In response to a wild polio outbreak in southern Khyber Pakhtunkhwa in 2022, 24 teams were deployed at strategic points along the border of the endemic zone to vaccinate travelers and prevent the virus from spreading, while up to 38 teams were deployed along the Mehsud Belt in Upper South Waziristan where vaccination activities had been disrupted for over a year. More than 1.2 million children who might have missed their doses during previous drives were reached with oral vaccines.
- Eid/Ramadan Vaccination Initiative: Over 600 teams deployed at 216 key transit points and public places like malls and parks vaccinated 1.6 million children during the high-travel season of Ramadan and Eid to prevent the spread of poliovirus.
- Voluntary Repatriation Centers: To prevent cross-border spread of poliovirus with people on the move, over 50,000 children were vaccinated at centers established for the repatriation of unregistered foreigners.



1.2.2. BIKERS STRATEGY: VACCINATION ON WHEELS

- Nomads Immunization Initiative: Biker teams administered oral and injectable polio vaccines to 471,479 children in addition to administering other 164,577 routine immunization doses to children from nomadic communities (often missed in polio drives due to their frequent movements).
- **Search Team Outreach Plus Strategy:** Biker teams administered oral and injectable polio vaccines to 30,454 children and provided 56,834 routine doses to vulnerable kids in union councils of Peshawar with no routine vaccinators, low immunization coverage and high numbers of zero-dose and under-vaccinated children.



1.2.3. JOINT INTERVENTIONS BY THE POLIO ERADICATION PROGRAMME AND THE EXPANDED PROGRAMME ON IMMUNIZATION

 Multi-Antigen Campaigns: Leveraging joint resources and expertise of the Polio Eradication Programme and the Expanded Programme on Immunization, oral polio vaccines were integrated in routine vaccination campaigns to reach a larger number of children with essential vaccines in one go:

> **2021** – As one of the world's largest-ever Measles-Rubella campaign reached a record 90.2 million children under 15 in just 12 days, the same teams administered the oral polio vaccine to 32.4 million children under five.

2022 – An integrated Typhoid Conjugate Vaccine campaign reached 5.8 million children under 15 with TCV doses and 1.3 million children under 5 with polio drops.



• **Reaching the Unreached:** Through the "Reaching the Unreached" initiative, the Pakistan Polio Eradication Programme and the Expanded Programme on Immunization joined efforts to reach vulnerable children with supplementary polio vaccines and routine immunization doses in 69 union councils of endemic southern Khyber Pakhtunkhwa, where routine vaccination coverages and supplementary polio vaccinations remained critically low. Two rounds of the "Reaching the Unreached" initiative were completed in 2023, vaccinating 470,000 children with oral polio vaccines and ensuring coverage of nearly 13,500 zero-dose children with routine immunization doses.





CHAPTER 2: MONITORING AND EVALUATION

WHO deployed more than 33,000⁶ monitors and surveyors to assess coverage and campaign quality of polio supplementary immunization activities through key standard performance indicators, lot quality assurance sampling (LQAS) and post-campaign monitoring (PCM), cementing WHO's technical expertise in conducting successful large-scale campaign assessments. Over 607,000 children were assessed during LQAS surveys, and 1,591,180 children were assessed during PCM assessments held after polio campaigns throughout 2021-23. The results of these surveys helped identify areas where campaign quality was suboptimal or coverage was low, enabling data-driven decision-making to adopt corrective measures in upcoming rounds. To support the experts already involved in monitoring and evaluation of vaccination campaigns, WHO engaged and trained 6,000 students from 67 universities to support these monitoring activities and to ensure independent assessments, while also helping them gain meaningful field experience in public health.

Taking over from a third-party organization, WHO has directly managed LQAS and PCM since 2021, aligning both methodologies with GPEI guidelines to ensure standardized assessments. This transition has strengthened data integrity and provided more structured oversight of evaluation activities.

KEY DATA POINTS



607,800

children assessed through lot quality assurance sampling.



10,839 surveyors conducted independent lot quality assurance sampling in 10,130 union councils.



1.5 M+ children assessed through post-campaign monitoring.



22,254 surveyors conducted independent post-campaign

monitoring in 21,464 lots.

⁶ Estimated overall number. An individual monitor can cover multiple campaigns.

2.1. LOT QUALITY ASSURANCE SAMPLING (LQAS)

WHO partnered with the Government of Pakistan in leading the Monitoring and Evaluation of polio drives using lot quality assurance sampling (LQAS) as a key tool to assess campaign quality and identify areas where children might have been missed. Every campaign, a total of 60 children – one child each from 10 different houses located in six randomly selected clusters – are assessed in each union council (UC) or LQAS lot. Depending on the number of unvaccinated children found, the UC is assessed as "pass", "intermediate", or "low quality".

Throughout 2021-2023, more than 10,000 LQAS surveyors were mobilized to assess 10,130 lots in high-priority areas, including endemic and outbreak districts, bordering UCs and in Afghan refugee camps where the risk of missing children and continued virus circulation remains high, making monitoring essential to gauge campaign quality and reach. LQAS pass rate ranged between 78.67% and 82.31%.

2.2. POST-CAMPAIGN MONITORING (PCM)

Unlike lot quality assurance sampling, which measures the quality of the campaigns, post-campaign monitoring (PCM) provided direct coverage estimates. To this end, surveyors verify polio vaccination status of children by checking the finger marking of every child in randomly selected 30 houses in the union councils selected for PCM as well as random spot survey of 50 children available in streets or other outdoor settings. While LQAS and PCM assessments may be conducted in the same districts, their methodologies remain distinct, ensuring separate evaluations of quality and coverage.

In 2021-23, 22,254 surveyors were deployed to assess 21,464 PCM lots. The overall pass rate ranged from 89.75% in 2021 to 74.39% in 2023.





CHAPTER 3: SURVEILLANCE

Throughout 2021-2023, WHO partnered with the Government of Pakistan to maintain the largest and most-sensitive poliovirus surveillance network in the world with 11,643 acute flaccid paralysis (AFP) reporting sites nationwide and 118 environmental sampling sites across 83 districts. Nearly 52,000 APF cases were reported from the AFP surveillance system, while around 4,900 environmental samples were collected for testing, which led to the detection of 27 polio cases and 228 positive environmental samples in 2021-23. These results were instrumental in informing evidence-based decision-making and rapid response strategies.

KEY DATA POINTS



11,643 acute flaccid paralysis (AFP) reporting sites.



118 environmental sampling sites.



51,923 AFP cases reported for testing.



53 additional environmental surveillance sites established.



120,000

community and health facility-based focal persons trained to identify and report AFP cases.



4,894

environmental samples collected for testing.



27 cases of wild poliovirus type 1 confirmed.



228 environmental samples confirmed positive for poliovirus.

3.1. ACUTE FLACCID PARALYSIS (AFP) SURVEILLANCE

The gold standard of poliovirus surveillance, the acute flaccid paralysis (AFP) surveillance network, consists of over 11,643 government and private health facilities, informal and traditional healthcare providers and key community informants that report any case of sudden weakness or paralysis in children under 15 years of age to the Pakistan Polio Programme for polio testing. Throughout 2021-23, stool samples collected from 51,923 AFP cases were tested at the WHO-accredited Regional Reference Lab for Polio at the National Institute of Health in Islamabad at no cost to the family. Wild poliovirus was detected in 27 children, which led to the notification of the cases and further genetic sequencing to determine the origins of the virus strain and its genetic lineages. Key highlights of AFP surveillance for the reporting period included:

- **Expansion:** The addition of 676 AFP surveillance sites led to a nearly 30% increase in AFP case reporting, from 13,118 cases reported in 2021 to 19,772 reported in 2023.
- **Community-based Surveillance:** The training of nearly 120,000 community and health facility-based AFP focal persons strengthened AFP reporting in polio core reservoirs, difficult-to-access areas and areas bordering Afghanistan. Annually, nearly 10% of AFP cases are reported through this community-based surveillance.
- **Contact Sampling:** 24,518 contact samples were collected for all inadequate⁷ AFP cases and AFP cases reported from mobile populations, access-compromised and hard to reach areas, and Afghan refugees, which helped confirm four (4) polio cases.
- Healthy Children Stool Sampling: Stool samples were collected and tested from 836 healthy children in Khyber Pakhtunkhwa (KP), Punjab and Sindh to supplement surveillance. This practice is conducted in areas where high-risk and vulnerable populations reside, but poliovirus is not being detected through any surveillance source and, therefore, there is a risk of undetected circulation.

3.2. ENVIRONMENTAL SURVEILLANCE

Complementing AFP surveillance, environmental (wastewater) sampling is a supplementary tool used to detect virus circulation, identify affected geographies and implement outbreak response vaccination rounds to strengthen population immunity. The environmental surveillance (ES) network was expanded from 71 sampling sites in 49 districts to 118 sites in 83 districts in 2023, strengthening surveillance coverage and better informing outbreak response strategies. A total of 228 positive samples of poliovirus were detected throughout 2021-23. Key highlights for environmental surveillance during the reporting period are:

- **Expansion:** The addition of 53 environmental surveillance sites more than doubled the collection of wastewater samples from 1,006 in 2021 to 2,563 in 2023, helping the Polio Programme in identifying areas of poliovirus circulation and planning vaccination activities to increase population immunity.
- **One-time sampling:** 697 one-time environmental samples were collected and tested from high-risk mobile populations and access-compromised areas to detect circulation. Wild poliovirus was detected only once through this sampling.





3.3. WHO-ACCREDITED REGIONAL REFERENCE LAB FOR POLIO

The WHO-accredited Regional Reference Lab for Polio, located at the National Institute of Health, Islamabad, supported poliovirus surveillance through swift and accurate testing of all stool and wastewater samples, and genetic sequencing and analysis to identify virus genetic and geographic linkages. The lab, which has been declared the best in 146 laboratories across the world by experts of the Global Polio Eradication Initiative's Technical Advisory Group, also supported poliovirus surveillance in Afghanistan through stool sample testing and confirmation of wild polio cases.

Throughout 2021-23, the laboratory tested 125,333 stool samples collected from AFP cases and 6,591 sewage samples collected from sites across the country⁸, while 33,117 stool samples were tested from Afghanistan. The key highlights were:

- **Expansion:** The lab was expanded in 2023 through the construction of a new facility equipped with high-quality equipment and resources to accommodate the increase in sample collection.
- **Maintained quality:** The lab maintained all quality standards set by the Global Polio Laboratory Network and successfully achieved the annual accreditation for poliovirus testing, ensuring the highest standard of testing and genetic analysis.
- **Support to strengthen surveillance:** Staff in 80 districts with environmental sampling sites were trained. In parallel, real-time temperature monitoring devices, called LogTags, were introduced to monitor the reverse cold chain of samples during transport. Over 17,000 stool samples and 1,600 environmental samples were assessed during transport through these devices.
- **Support to other labs:** Genetic sequencing support was provided to the National Institute of Health to analyze cases of Measles, Mumps, Rubella, Rotavirus, FMDV, SARS-CoV-2, Norovirus, and CCHF. In addition, the laboratory supported the establishment of polio environmental surveillance labs in Saudi Arabia and Iraq.

⁸ These numbers include all overall stool samples processed at the Regional Reference Lab for Polio from AFP cases, contact sampling and healthy children sampling, and ES samples collected from regular sites and one-time or additional sites.



Throughout 2021-2023, WHO supported the Government of Pakistan to lead the implementation of several innovative interventions in the Polio Eradication Programme operations when faced with persistent challenges like missed children in vaccination drives due to inconsistent access and population movement, suboptimal monitoring and evaluation, and surveillance challenges, particularly in high-risk areas like southern Khyber Pakhtunkhwa and Balochistan. These new interventions helped bring vaccines to previously unreached children and increase immunization coverages. Initiatives like vaccination for nomadic children and hard-to-reach children collectively provided oral polio vaccines and other routine immunizations to over 724,000 children. In parallel, the engagement of up to 6,000 university students in monitoring and evaluation activities ensured effective monitoring, while the use of temperature recording devices helped strengthen surveillance efforts.

KEY DATA POINTS



1.2 M+

children given polio drops through a ring-fencing vaccination strategy in southern KP.



724,000+

children in underserved nomadic communities and hard-to-reach areas vaccinated with polio drops and other routine vaccines.



17,000+

stool samples and 1,600+ environmental samples monitored through temperature monitoring devices meant to control reverse cold chain to ensure quality.



6,000

students from 67 universities trained and deployed for monitoring and evaluation activities.

4.1. RING-FENCING VACCINATION

As insecurity, logistical barriers and disruptions to vaccination campaigns in southern Khyber Pakhtunkhwa (KP) led to inconsistent access for polio teams, a ring-fencing vaccination strategy was implemented to keep over 1 million children residing in the endemic zone protected from polio. The deployment of 102 teams at strategic entry and exit points along southern KP and the Mehsud Belt in Upper South Waziristan district, where campaigns were suspended for over a year, enabled the oral vaccination of 1.2 million children. The intervention created a 'ring' of immunity in these high-risk zones, while preventing the virus from being spread to other areas by travelers. This strategy was critical in keeping the endemic YB3C genetic cluster of wild poliovirus type 1 restricted to southern KP.

4.2. NOMADS VACCINATION INITIATIVE

Since a significant number of nomads, refugees and seasonal migrants from Afghanistan and within Pakistan move throughout the country, settling in slums or district outskirts along the way, the risk of poliovirus being spread by these under-vaccinated populations remains high. WHO-led Polio Programme teams mapped nomadic movement patterns and launched the Nomads Vaccination Initiative in 2022 to reach children in these nomadic communities who are often missed in polio door-to-door vaccination campaigns and have limited or no routine immunization doses because of frequent movement.

Under this initiative, up to 76 biker teams (composed of 1 vaccinator and 1 assistant) were deployed to priority endemic southern Khyber Pakhtunkhwa (KP) districts and neighboring districts of Punjab and Balochistan. These teams reached 326,968 nomadic children in their settlements with oral polio vaccines. In addition, they administered 145,511 injectable polio vaccines and 164,577 routine immunization doses (to prevent other diseases) through integrated efforts by the Polio Eradication Programme and the Expanded Programme on Immunization. These mobile teams traversed difficult terrain and long distances to reach children in far-flung areas and bring them crucial healthcare services, reinforcing WHO'S commitment to protecting the health and wellbeing of all children, no matter who they are or where they live.



4.3. SEARCH TEAMS OUTREACH PLUS INITIATIVE

The Search Teams Outreach Plus Initiative was piloted in select union councils of Peshawar in 2023 to address persistent immunization gaps in areas with low routine immunization coverage, high numbers of children with zero doses and elevated rates of children missed during house-to-house polio campaigns. Integrating resources from the Polio Eradication Programme and the Expanded Programme on Immunization, 30 biker teams were deployed to identify and vaccinate children under five with polio drops. They also provided other routine immunization doses to newborns and children between 0-23 months with zero or incomplete doses. These teams delivered polio drops to 18,956 children, injectable polio vaccine to 11,498 children and other routine immunization doses to 56,834 previously missed children.

4.4. LOGTAGS FOR SURVEILLANCE QUALITY

To strengthen the reverse cold chain mechanism and ensure that sample quality is maintained during transportation, WHO supported the Government of Pakistan to introduce the use of LogTag digital devices for real-time temperature monitoring of stool and environmental samples collected for testing.

These devices collect accurate and periodic temperature recordings of the sample carrier box, ensuring samples are kept within the required temperature range, i.e. < 8°C, during storage and transportation to the lab. Maintaining the right temperature is crucial for preserving sample integrity and preventing degradation that could impact accurate diagnostic results.

The introduction of LogTags began with a small-scale rollout in 60 districts and later expanded to 159 districts across the country. A total of 17,183 stool samples collected from acute flaccid paralysis (AFP) cases and 1,654 environmental samples were monitored through LogTags in 2023. Of these, 25 environmental samples and 78 stool samples with temperature breach were recollected and tested, of which, two sewage samples were positive and one AFP case from Orakzai was reported as positive for polio.

4.6. INDEPENDENT CAMPAIGN MONITORING

As WHO resumed direct oversight of monitoring and evaluation of supplementary immunization activities, implementing the Global Polio Eradication Initiative guidelines for quality assessments, a novel approach was introduced to ensure independent assessments of campaign activities. Through collaboration with educational institutes, final year university students of public health, sociology and other related fields were deployed to conduct lot quality assessment sampling and post-campaign monitoring in the field after receiving training in the two methodologies. A 50-50 male to female student ratio was maintained in assessment teams. This ensured the presence of women and facilitated better access to households, which helped improve campaign monitoring results and its reliability. Since 2022, over 6,000 students from 67 Pakistani universities have been engaged in post-campaign monitoring, reinforcing independent assessments while providing crucial field experience to the next generation of public health experts.





CHAPTER 5: GENDER IN WHO PEI

In line with the Global Polio Eradication Initiative (GPEI)'s Gender Equality Strategy 2019–2026, WHO supported the Government of Pakistan to implement a gender-responsive approach for the Pakistan Polio Eradication Programme and accelerate gender mainstreaming by recruiting more women in technical, operational and decision-making roles. Similarly, the recruitment of women in field supervisory cadres of frontline workers, especially in areas with sensitive gender norms, facilitated access to households and improved engagement with female caregivers on the significance of polio vaccination.

The Technical Advisory Group on polio eradication (TAG) has commended this progress, while emphasizing the importance of workforce safety. Some of the key activities led by WHO through the National Emergency Operations Center (NEOC)'s Gender Working Group are outlined below:

- A sex-disaggregated database for workforce participation in various areas of work is maintained to assess progress of gender mainstreaming.
- Challenges identified during focus group discussions with frontline workers supervisory staff such as weak support systems, high workload and security risks for solo vaccinators were addressed through greater team support and workload rationalization.
- Frontline workers from high-risk districts were engaged in telephonic surveys and 14 listening workshops under the Polio Programme-led "Frontline Worker Co-Design Initiative". The goal was to identify challenges and co-create solutions for better service delivery. A series of recommendations related to operations, resource planning and communications emerged from these one-of-a-kind listening exercises and were shared with the NEOC for endorsement. Based on one of these recommendations, the incentive for frontline workers increased from 750 PKR/day to 1,231 PKR/day in 2023.
- To foster a conducive and respectful work environment, information, education and communication materials on workplace respect and safety were developed and distributed to the frontline workforce.
- A mobility allowance of 5,000 PKR was introduced to increase the percentage of female supervisors in the field, ensuring better household access and team interactions with communities.

WHO continues to prioritize gender balance and gender-responsiveness in its polio eradication interventions, including capacity-development of women in health service delivery to align closely with the broader global immunization agenda and the gender integration goals of the Global Polio Eradication Initiative.

CHAPTER 6: NATIONAL CERTIFICATION COMMITTEE

The National Certification Committee (NCC) convened biannual meetings throughout 2022-23, reviewing the progress and data provided by the Pakistan Polio Eradication Programme and advising on areas of improvements to fulfil the requirements to achieve the eradication certification.

Operating in alignment with WHO's Regional Certification Commission for the Eastern Mediterranean Region, the NCC is an independent body comprised of experts in pediatrics, immunization and neurology appointed by the national government, in consultation with WHO Pakistan, to evaluate poliovirus surveillance performance, vaccination coverage and gaps, and evaluate risks that could impact polio-free certification readiness.

In its meetings, the NCC reviewed the epidemiological status, surveillance and operations data and indicators, and the Polio Programme's risk analysis and containment efforts. The NCC's main recommendations for the reporting period were:

- Expand environmental surveillance and acute flaccid paralysis (AFP) surveillance capacity, particularly in underperforming districts, to unveil any undetected circulation of the poliovirus.
- Improve clinician engagement in AFP detection and reporting.
- Enhance synergies with the Expanded Programme on Immunization for effective polio vaccination delivery and strengthening of routine vaccination.
- Enhance cross-border surveillance in collaboration with Afghanistan to mitigate virus reintroduction.
- Provide Water, Sanitation and Hygiene (WASH) and Integrated Service Delivery (ISD) to increase vaccine acceptance and vaccination efficacy.
- Develop and maintain an annual certification risk analysis.

WHO supported the Pakistan Polio Eradication Programme in implementing these recommendations through:

- Expansion of the environmental surveillance network to 83 districts to detect poliovirus circulation and strengthen AFP surveillance through the introduction of community-based surveillance, increased engagement with healthcare providers on AFP reporting, healthy children stool sampling, and temperature monitoring for consistent sample quality.
- Enhanced synergy with the Expanded Programme on Immunization through joint data and resource sharing in vaccination initiatives such as "Reaching the Unreached" and smaller targeted campaigns.
- Enhanced cross-border coordination with data sharing and joint surveillance activities supplemented by all-age vaccination at the border to prevent virus spread.
- Introduction of polio pluses like provision of soaps and implementation of health camps in high-risk communities for increased vaccine acceptance.
- Development of a draft certification risk analysis for NCC's review.

CHAPTER 7: THE ROAD AHEAD

Periodic detections of wild poliovirus throughout 2021-23 were largely contained through the implementation of targeted vaccination campaigns and outbreak response activities. However, the resurgence of cases in late 2023 – coinciding with large-scale repatriations of unregistered foreigners – underscored the persistent risk of virus spread with populations on the move. In response, WHO supported the Government of Pakistan to launch targeted vaccination strategies for repatriating populations, a measure set to continue in 2024.

Moving forward, an intensified vaccination campaign schedule will aim at ensuring consistent immunization, with a particular focus on reaching children in polio high-risk areas and breaking clusters of under-immunized children in endemic and core reservoir districts. Risk assessments and epidemiological data will drive the implementation of polio door-to-door vaccination campaigns and alternative strategies, with a strong emphasis on maintaining high-quality standards.

Cross-border coordination remains a priority to prevent poliovirus transmission between Pakistan and Afghanistan. Strengthening cross-border vaccination efforts and ensuring synchronization of polio supplementary immunization activities across the country will be key to halting the virus's spread. WHO will continue to support the NEOC in implementing these crucial activities.

To enhance early detection, surveillance will be expanded through additional acute flaccid paralysis (AFP) reporting and environmental surveillance sites. Strengthened engagement with key AFP focal persons in communities and health professionals will aim to ensure timely case identification. Additionally, genetic sequencing will be leveraged to track transmission patterns and guide targeted interventions.

With these measures, WHO will continue partnering with the Government of Pakistan to lead polio eradication efforts, adapting and strategizing where necessary to curb virus transmission and advance towards a polio-free Pakistan.

World Health Organization Country Office Chak Shahzad, Islamabad, Pakistan.

