

Introduction

The first 2017 meeting of the Technical Advisory Group (TAG) on Polio Eradication in Pakistan was held in Islamabad on 30-31 March. The meeting was chaired by Dr Jean-Marc Olivé, attended by seven TAG members and supported by the Pakistan Polio Eradication Team led by Senator Ayesha Raza Farooq, the Prime Minister's Focal Person for Polio Eradication. Local and international partners, and donors also participated (**see List of Participants**). The meeting was opened by Saira Afzal Tarar, the Minister of National Health Services Regulation and Coordination, Islamic Republic of Pakistan.

Since the last TAG meeting in June 2016, steady progress has been made towards interruption of poliovirus in the country. Nine WPV1 cases have been reported for the remainder of 2016, and two between January and March 2017. Point in time comparison for the three-months period January – March shows a 75% decline in the number of WPV cases: eight in 2016, and two in 2017. Only one of the 11 WPV1 cases reported since June 2016 occurred in a core reservoir (Killa Abdullah, Balochistan).

Programmatically and operationally, considerable progress was made in the last nine months, particularly in key areas of AFP and environmental surveillance, expansion of community-based vaccination in core reservoirs, detailed follow-up of missed children and refinement of strategies for vaccinating high-risk mobile populations (Panel 1).

Panel 1 – Major programmatic milestones since June 2016

July-September 2016

- Community-based vaccination (CBV) programme expanded in all of Karachi, Quetta, Killa Abdullah, Pishin districts and Khyber Agency
- Mobile-team performance improvement action plan (MTAP) implemented in Karachi, North Sindh, and Khyber Pakhtunkhwa
- Prime Minister's Focus Group meeting held in August 2016

October–December 2016

- National Polio Management Team meeting held in October
- 76 dedicated district and divisional surveillance officers hired, trained and deployed
- Laboratory and surveillance team joint review of all environmental surveillance sites conducted
- Environmental surveillance network expanded to Nowshera, Charsadda, Bannu, Kohat, Mardan, Khuzdar, Loralai, Zhob, Dadu, Kambar, Sanghar, Sargodha, and Bahawalpur districts, rationalized/increased sites located in Karachi, Pishin, Faisalabad, Quetta, and Peshawar
- Round 1 sero-survey conducted in Pishin, Karachi, Peshawar (Town 3&4) and Larkana

January – March 2017

- National Polio Management Team meeting held in January
- Response to type 2 events in Balochistan completed
- Routine immunization assessment in Tier 1 districts (Khyber agency, Peshawar, Killa Abdullah and Quetta districts completed
- Sero-surveys conducted in Quetta, Killa Abdullah, Karachi, Peshawar (Towns 1&2), Sukkur.
- National and Provincial Certification Committee Meetings held
- Phase 1 containment activities completed.
- Combined IPV/bOPV campaigns held in Tier 1&2 districts targeting 3.9 million children between 4 and 23 months.

Government commitment and oversight remained strong at all levels, from the National Task Force (NTF) and the Prime Minister’s Focus Group (PMFG) over the network of EOCs to the Deputy Commissioners that now lead all polio-related activities in their respective districts.

This TAG meeting took place two months before the 2016-17 low transmission season draws to an end. With polio cases at a historic low but transmission still occurring in the core reservoirs and outbreaks in a number of non-endemic areas, this meeting provided the opportunity, at a highly critical time, to obtain an expert view and advice for the current situation. Panel 2 shows the questions put to TAG by the Government of Pakistan and the Global Polio Eradication Initiative partners.

Panel 2 Questions put to TAG by Government of Pakistan and Global Polio Eradication Initiative partners

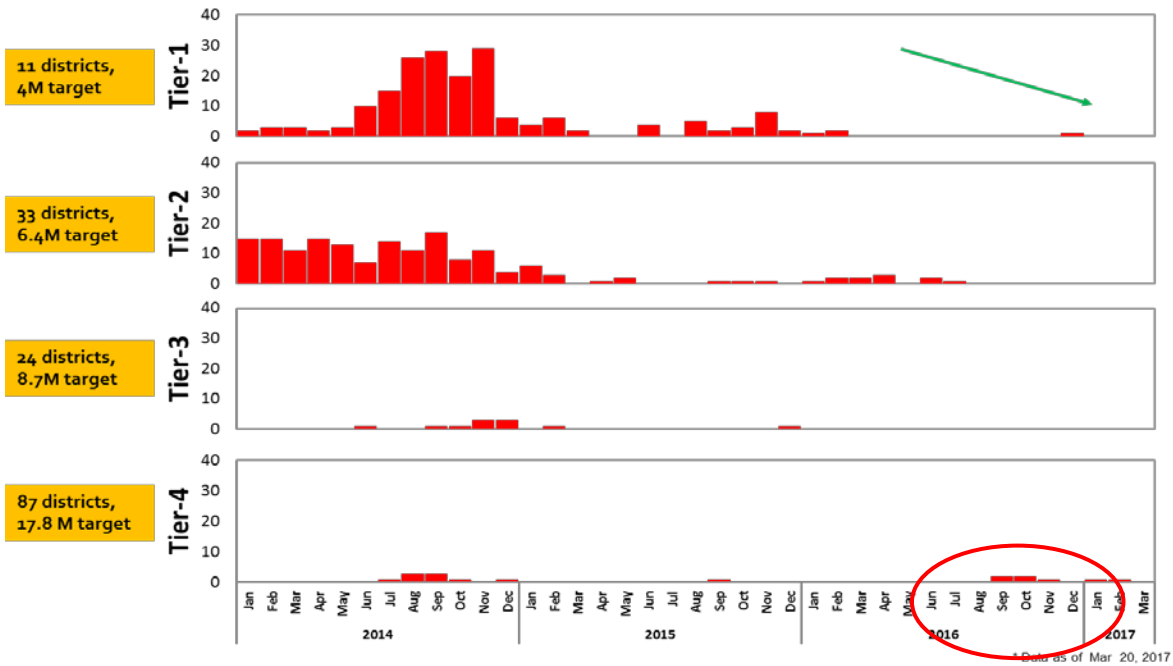
- Any immediate tweaks recommended for the remaining Low Season? What additional/innovative approaches can be adopted to clear WPV persistently circulating in Peshawar and Quetta block?
- Does TAG support the continued intense programmatic focus on the current tier-1 and tier-2 districts?
- Does TAG endorse the proposed SIAs calendar in 2017?
- Is the current HRMP vaccination strategy adequate enough to close immunity gap among these sub-population? Should higher age groups of high risk mobile populations be vaccinated?

Findings

Pakistan Program

Twenty WPV1 cases were reported in 2016, and two cases between January and March 2017 (Figure 1). During this 15 months’ period, the core reservoir areas gave rise to only 4 of these 22 cases— one in Karachi in January 2016, one in Peshawar in February 2016 and two in Quetta block in February and December 2016. Since September 2016, most (8/11) cases were detected as part of outbreaks in Tier 4 districts of South Sindh (Badin and Sujawal), Khyber Pakhtunkhwa (Kohistan), Punjab (Lodhran), and Gilgit-Baltistan (Diamir).

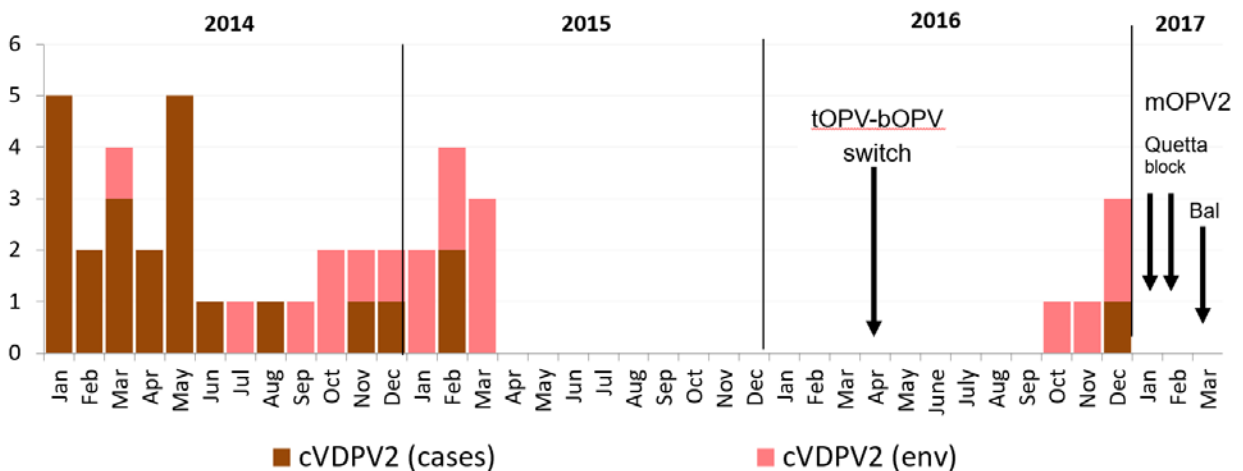
Figure 1 WPV cases by Tiers, Pakistan, 2014-17



The genetic diversity of poliovirus in Pakistan had reached an all-time low during the low transmission season 2015-16. This low was sustained throughout the high season of 2016 and the low season 2016-17.

Following the switch from tOPV to bOPV in April 2016, one cVDPV2 case and four cVDPV2 isolates were detected from Quetta block. The Balochistan program responded to the cVDPV2 circulation with two targeted mOPV2 rounds in Quetta block in January and February 2017, and one province-wide mOPV2 round in March 2017 (Figure 2). An additional IPV campaign will be conducted at the end of April 2017.

Figure 2 cVDPV2 isolates (cases, environmental samples), Pakistan, Jan 14 - Mar 17



Since July 2017, with a renewed focus on addressing gaps in surveillance, the National programme implemented the “Surveillance for Eradication” plan. To achieve a performance boost, an already strong AFP surveillance system was further strengthened through the deployment of additional staff. Table 1 highlights some of the progress made in surveillance since the last TAG.

A nation-wide review of the environmental surveillance system was conducted at the end of 2016, resulting in the relocation of some, and the addition of new sites to reach a total of 53 active sites throughout the country.

The proportion of WPV-positive environmental samples continued to decline: from 20% in 2015 to 13% in 2016, but slightly increased to 16% in the first quarter of 2017. The last indigenous persistent transmission in Karachi was in March 2016 while Peshawar saw an 86% reduction in the number of circulating WPV1 chains. Only in Quetta block was a reversal of fortunes observed with the intensification of local transmission starting in summer 2016.

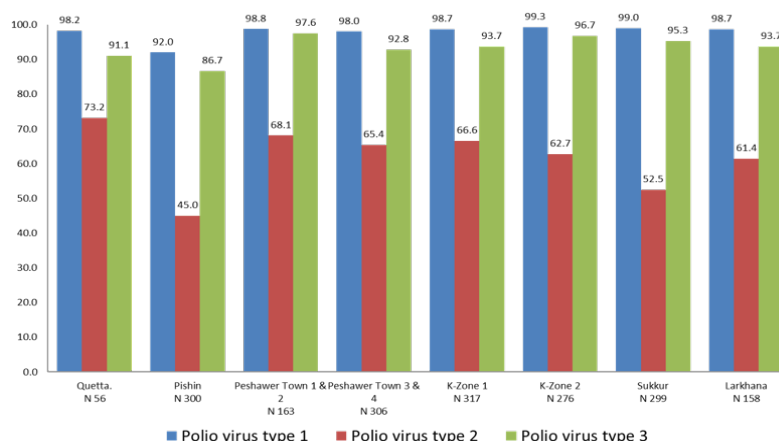
The primary challenge to stopping WPV1 transmission now is circulation across the common southern reservoir stretching from Quetta to the banks of the Helmand river in southern Afghanistan. This extended zone has become the primary hub of WPV1 transmission and poses a threat to both countries.

Household sero-prevalence surveys in children 6-11 months were conducted by the Aga Khan University between November 2016 and March 2017. Preliminary results indicate at least 98% Type 1 and 90% Type 3 immunity in this age group for all study areas but Pishin (92% and 87% respectively). In comparison, Type 2 immunity was expectedly low in this cohort, 7-9 months after the tOPV-bOPV switch (Figure 3).

Table 1 AFP surveillance system –operational changes and impact, Jun 16- Mar 17

Activities	June 2016	March 2017
# Surveillance officers	9	76
# Environmental sites	43	53
# Zero-reporting sites	6,483	7,645
# Active sites	2,087	2,528
# persons oriented on AFP surveillance	10,266	27,709
# AFP cases reported	3,076	5,486
# AFP cases reported through community-based surveillance	222	836

Figure 3 Sero-survey among children 6-11 months, by study area and PV serotype, Nov 16 - Mar 17



Since the last TAG meeting, all Supplementary Immunization Activities (SIAs) were implemented as per NEAP, including three synchronized, single-phase NIDs (September, December 2016, January 2017) and a series of bOPV/IPV campaigns in Tier 1 and selected Tier 2 areas. Independent campaign monitoring was expanded and more emphasis given to real-time intra-campaign monitoring with immediate corrective actions (Figure 4).

Collective, strong focus on missed children was maintained with only 0.6% of the targeted children being missed in the last six months compared to 4% between September 2015 and March 2016. The percentage of still missed children among the recorded missed also declined to 5% or less (Figure 5). To further decrease the cohort of persistently missed children, strategic adjustments were made to sensitize the system for acquiring details and further mapping of guest and mobile children. This improvement is mainly attributed to the expansion and consolidation of CBV approach in Tier 1 districts.

Figure 4 Third Party Monitoring: Mean OPV coverage in NIDs by district, Sep 16-Jan 17

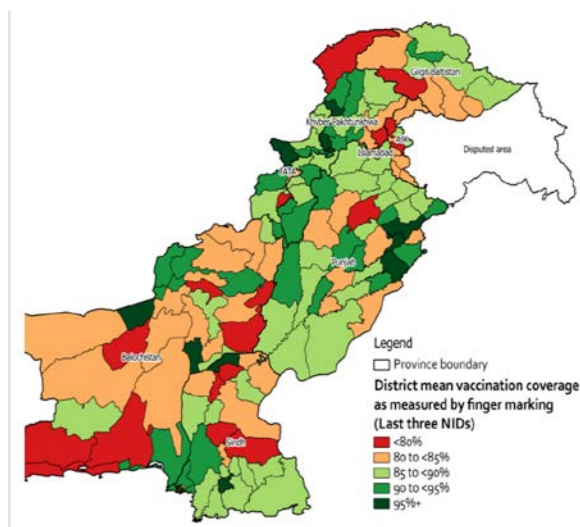
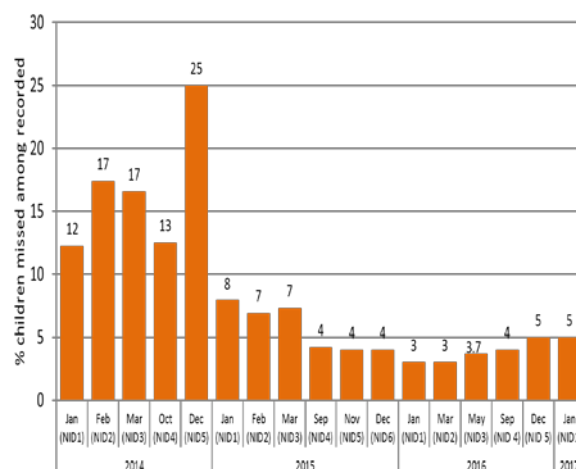


Figure 5 Percent “still missed” children (14 days after campaign start) among recorded missed, Pakistan, Jan 14 – Jan 17



TAG recognizes and commends the full integration of communication activities within the overall operational framework of the program and the role it has played improving capacity to identify and immunize children in the highest risk areas, and looks forward to seeing how communication strategies will be developed to maintain public support for the campaign and routine vaccination in the post-interruption phase.

LQAS pass rates of 90% were largely achieved in Punjab and FATA while Khyber Pakhtunkhwa, Balochistan and Sindh fell short of this NEAP target. Third party monitoring data showed the percentage of finger-marked children to be close to, or above 90% in all provinces (Figure 6, Figure 7).

Figure 6 Percent LQAS lots passed by province, Aug 16 – Jan 17

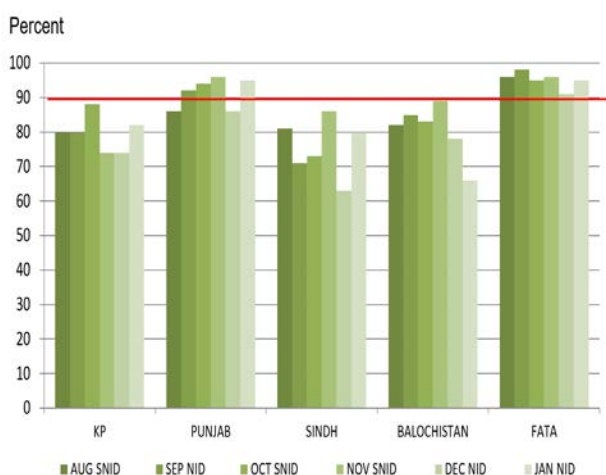
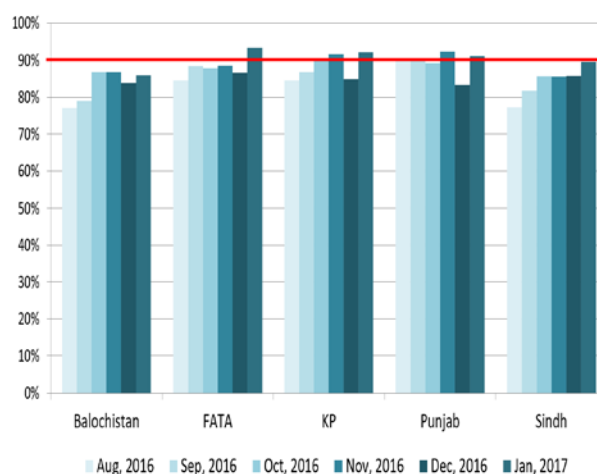


Figure 7 Percent children finger-marked by province, Third Party Monitoring, Aug 16 – Jan 17



Balochistan

Since January 2016, Balochistan reported two WPV cases: one from Quetta in February 2016, and one from Killa Abdullah in December 2016. Environmental samples have been on/off positive across Quetta block for the last 8-9 months; genetic analysis confirms ongoing local transmission (in Killa Abdullah since 2015) as well as importations.

Overall campaign quality in Quetta block improved since June 2016 albeit progress was inconsistent (Figure 8). In the remoter and more sparsely populated Tier 3-4 areas, progress was less apparent: since September 2016, 86% LQAS lots passed in Tier 3 and 59% in Tier 4.

The trend towards better campaign performance in Quetta block coincides with the full implementation of community-based vaccination (CBV) in August 2016. Since then, the number of *recorded missed” steadily increased due to better recording, while the number of “still missed” remained at or below 2% of the target – most in the ‘NA’ and very few in the refusal category (Figure 9).

Figure 8 Percent LQAS lots passed in Tier 1 districts, Balochistan, Jul 16–Feb 17

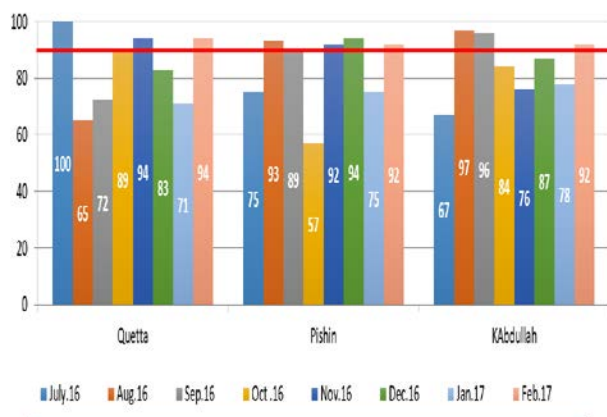
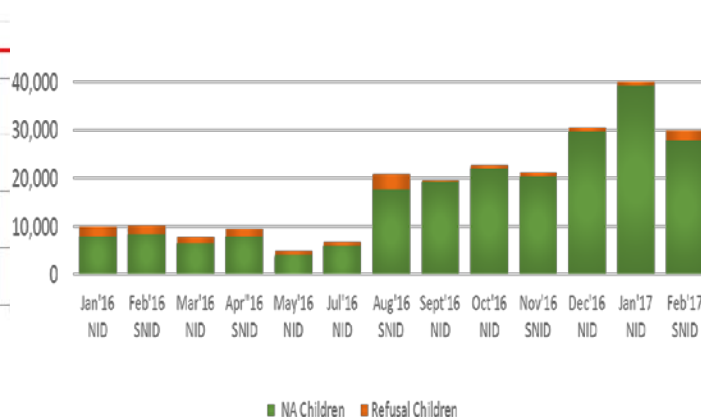


Figure 9 Number of “still missed”, Quetta block, Jan 16–Feb 17



Balochistan’s AFP surveillance system operates with good sensitivity and stool adequacy rates in Tier 1. In several Tier 3-4 districts, stool adequacy is below target and all silent Tehsils in 2016 (17% of total) were from Tier 3-4.

Federally Administered Tribal Areas

Since January 2016, FATA reported two WPV1 cases, both from South Waziristan with date of onset of the last case in July 2016. There are no environmental surveillance sites in FATA.

With support of the Pakistan Army and levies, access improved to the point that door-to-door campaigns could be successfully conducted in the still insecure and/or only partially accessible Union Councils of FR DI Khan, South and North Waziristan. While accessible to vaccination teams, some areas remained off-limits for external supervisors and monitors. An estimated 6,000 children are still inaccessible in pockets of South Waziristan and Khyber (Figure 10).

There are still areas in Bajaur, Mohmand, Khyber, Orakzai, and South and North Waziristan that have not been accessed by monitors in one or more campaigns during the current low transmission season.

A planned and already approved sero-survey could not be conducted in Bara and Jamrud tehsils of Khyber Agency because of inaccessibility to surveyors even though clusters could be taken across the border in Town 3 and 4 of Peshawar.

In the areas freely accessible to monitors, FATA maintained high-quality SIAs as demonstrated by 90% or higher LQAS pass rates (Figure 11). Immunizing HRMP remained a critical component of the program, including the tracking and vaccination of children crossing through informal routes into Afghanistan. AFP surveillance continued to operate at high sensitivity and >80% stool adequacy rates.

Figure 10 Accessibility in FATA, March 2017

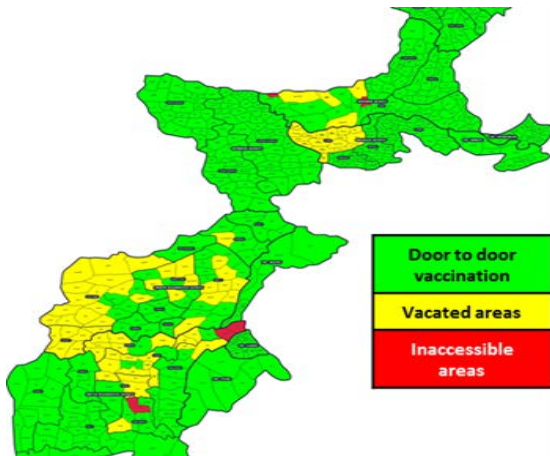
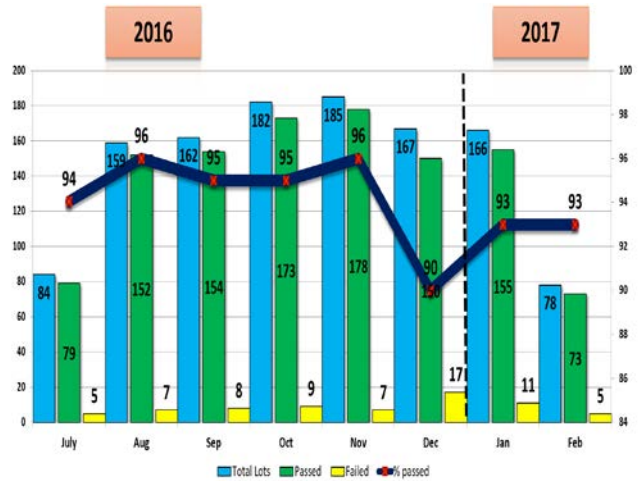


Figure 11 Number of LQAS, and % lots passed, FATA, Jul 16 – Feb 17



Khyber Pakhtunkhwa (KP)

Since January 2016, KP reported eight WPV1. The last case, in September, was detected in Kohistan, a Tier 4 district of North KP and genetically linked to an environmental isolate from Lahore. In South KP, no WPV1 cases have been detected since June 2016 but the program maintained a high state of alert due to continued transmission in the Central Corridor (last Bermal WPV1 case in December 2016). In Peshawar, the last WPV1 case goes back to February 2016 but environmental samples have been positive in Shaheen Muslim Town for the last nine months with genetic analysis confirming persistent local transmission of at least two lineages through to March 2017 (Figure 12).

Despite improvements in SIAs quality in 2016, such as achieving a very low proportion of “still missed” children (<0.6%), the NEAP targets for LQAS were not consistently achieved in Tier 1 during the current low transmission season (Figure 13) and never achieved in Tiers 2 and 4.

Figure 12 WPV1 environmental isolates, KP, Jan 16 – Feb 17

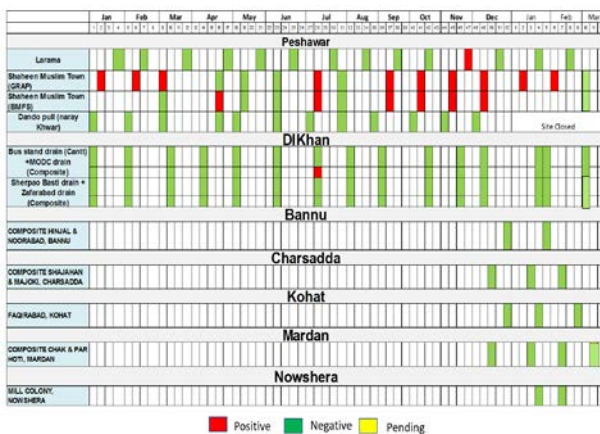
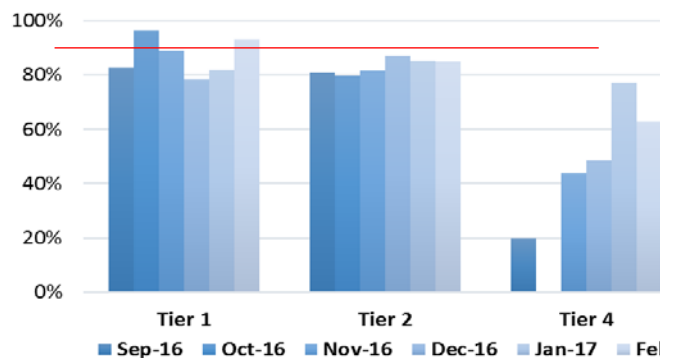


Figure 13 Percent LQAS lots passed by tier, KP, Sep 16-Feb 17



Sindh

Eight WPV1 cases were reported from Sindh in 2016: one from Karachi (January), three from North Sindh (February-April) and four from the lower Sindh Tier 4 districts of Badin and Sujawal (September-November).

From September 2016 to date, environmental surveillance in Karachi identified WPV1 viruses related to Quetta and Sujawal but none directly to previous indigenous transmission in Karachi. However, imported virus continues circulating again for the last three months, indicating re-established local transmission. The last positive environmental sample in North Sindh was from Jacobabad in August 2016, South Sindh has no environmental surveillance.

SIA quality in Karachi show a mixed picture with LQAS starting to reach 90% in the CBV UCs while ranging between 40-70% in the mobile team areas (Figure 14). Refusals in Karachi remain the highest in the country, making up one-third of the still missed children (Figure 15). They are increasingly reported from middle and upper class areas of the city.

Figure 14 Percent LQAS lots passed in CBV and mobile team areas, Karachi, Jan 16- Feb 17

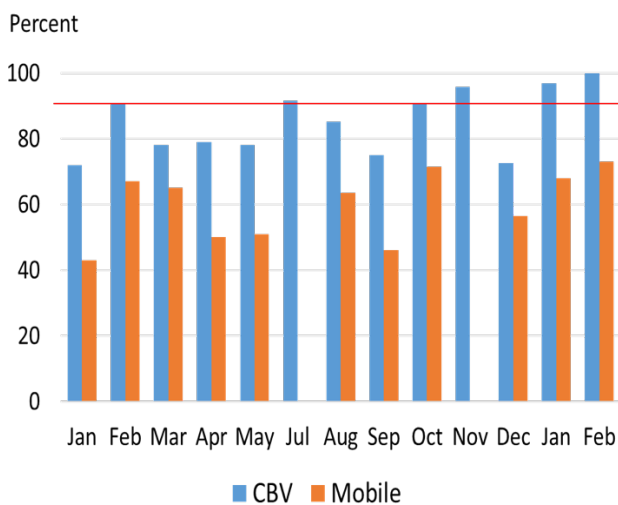
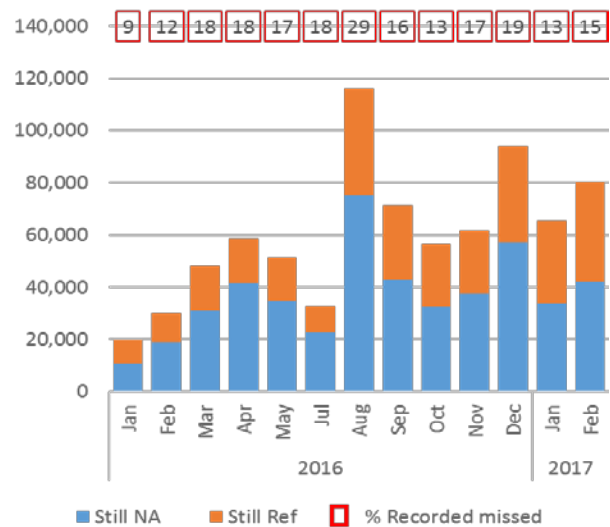


Figure 15 Still missed children (NA, refusals), as percent recorded missed, Karachi, Jan 16-Feb 17



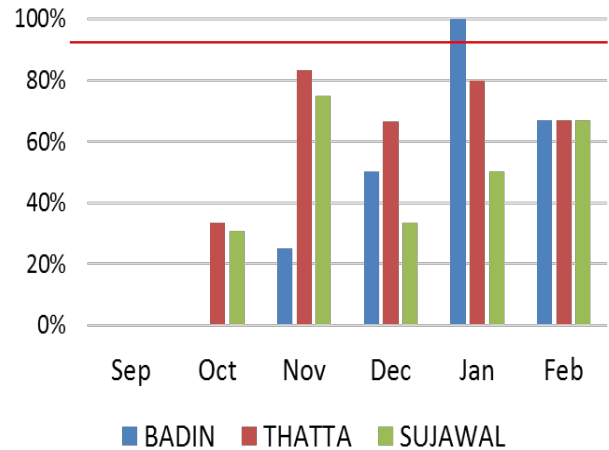
Campaign quality in the outbreak districts of South Sindh (Figure 16) remains suboptimal, despite the operational and managerial improvements since September 2016 (Figure 17). Current operational issues include challenges in attracting females for vaccination, difficulties in physical access to some of the coastal areas, weak infrastructure, and poor nutritional status of the population.

AFP surveillance in Sindh has met the revised indicators throughout the province. No silent Tehsils were reported in 2016.

Figure 16 Geographic distribution of WPV cases, Sindh, Jun 16 – Feb 17



Figure 17 Percent LQAS lots passed in lower Sindh coastal districts, Sep 16 – Feb 17



Punjab

Punjab had no WPV1 cases in 2016 but reported the country’s first in 2017 from the Tier 4 district of Lodhran, a long chain virus. Environmental samples have been intermittently positive in Lahore, Multan and Rawalpindi throughout 2016 and into 2017, with evidence of local transmission and exportation (Figure 18). The Lahore isolate was linked to the two 2017 cases in Khyber Pakhtunkhwa (Kohistan) and Gilgit-Baltistan (Diamir).

The program continued maintaining a strong focus on the systematic tracking and vaccination of the high risk mobile populations. However, with the continuous large population movements between Rawalpindi, Lahore and Multan Districts of Punjab and the polio reservoirs of KP, Balochistan and Karachi, the challenge remained, and will remain considerable.

Punjab continues to have strong government commitment and overall good SIAs and surveillance performance (Figure 19). However, the continued circulation of local virus indicates gaps in surveillance and SIA performance which still need to be addressed.

Figure 18 WPV isolates from environmental samples, Punjab, Jan 16 – Mar 17

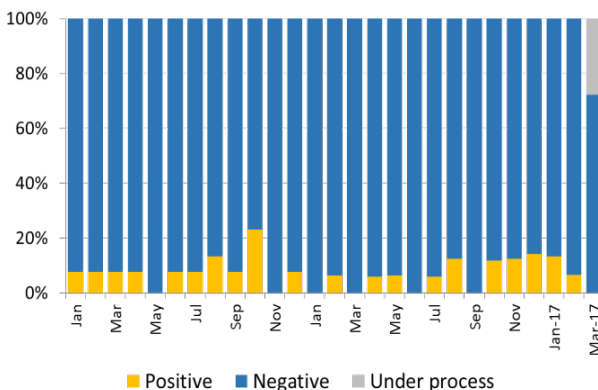
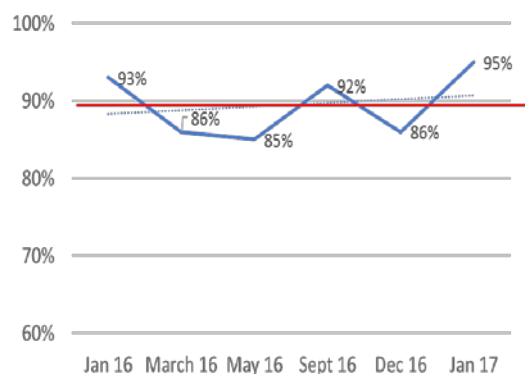


Figure 19 Percent LQAS lots passed during NIDs, Punjab, Jan 16 - Jan 17



Punjab government has reiterated that the twin cities of Rawalpindi and Islamabad form one epidemiological block which requires the same campaign quality in each city to avoid virus moving from one to the other. While some level of cooperation for polio eradication activities exists, this cooperation is now being strengthened.

Islamabad

No WPV cases have been reported from Islamabad for almost a decade (2008) and environmental samples were consistently negative throughout 2016. However, WPV1 was again isolated from an environmental sample in February 2017 with virus genetically linked to Rawalpindi environmental isolates.

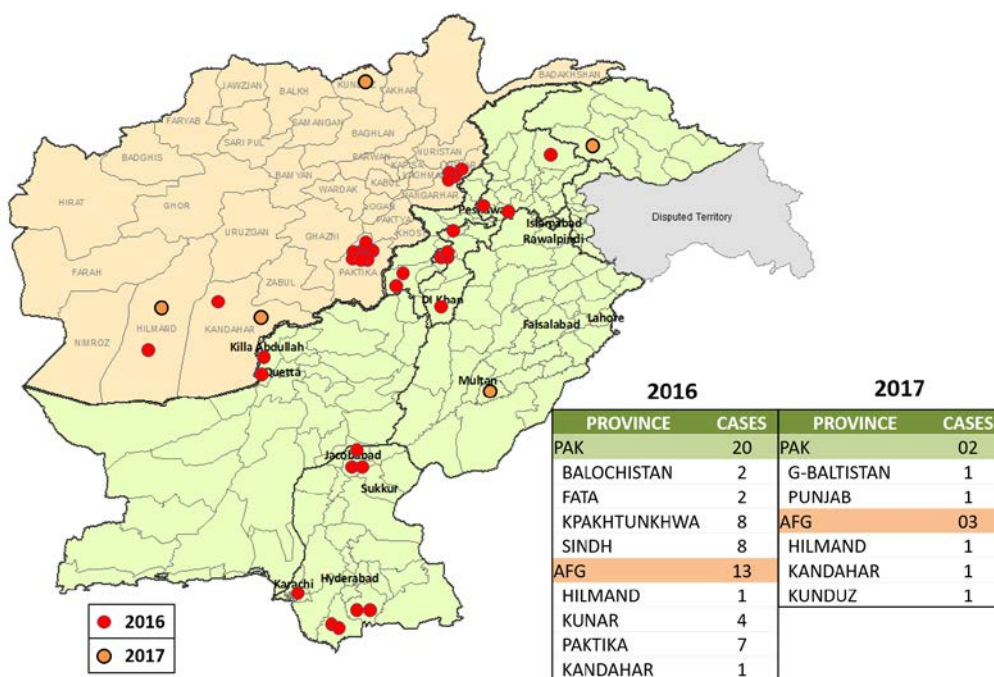
Overall, campaign performance in Islamabad remains below par with an average LQAS pass rate of 62%, and PCM coverage of 80-85% during the last six NIDs. As in the past, the selection and retention of an accountable workforce and the engagement of enough medical officers remain major challenges in the capital city.

Islamabad is part of the same epidemiological block as Rawalpindi, the latter being at high risk for WPV circulation. The current epidemiological situation warrants augmented efforts to improve polio activities in both cities.

Common Reservoirs

The WPV core reservoirs on both sides of the Afghanistan-Pakistan border are still key in maintaining transmission in the two countries. The exportation of WPV1 from South Waziristan into Paktika Province of Afghanistan and the ensuing outbreak serves as a stark reminder of the challenge to halt WPV spread between the two countries (Figure 20).

Figure 20 WPV cases, Pakistan & Afghanistan, 2016-17



Pakistan program targets all four risk scenarios that exist along the common border with various degrees of intensity:

1. Shared endemic WPV reservoir (southern/western and eastern/northern corridors).
2. Border populations outside the endemic zones.
3. Nomadic and seasonal movements.
4. Returnees and repatriated refugees.

Historically and at present, movement along the two corridors continues both in volume and across formal and informal routes. Permanent border and transit teams in Balochistan and Khyber Pakhtunkhwa cover the formal crossings systematically.

Transmission in border communities outside the main endemic transmission zones remained active, as evident by the Paktika/South Waziristan outbreak. FATA team has gradually intensified the tracking and vaccination of children of border communities which tend to use smaller, informal routes into Afghanistan (Figure 21).

In all Tier 1 districts, mobile children remain an important cause for 'still NA' but follow different patterns. In Quetta block, between July 2016 and February 2017, 62% of the 'still NA' were children absent from their home district (Figure 22) but usually still in the block. In Peshawar, between December 2016 and February 2017, 92% of the persistent NA were absent from their home UCs but usually still in their district. Only through a combination of improved transit vaccination, improved data sharing between districts and intensified coverage of all eligible children during SIAs and catch-up activities can the immunity gap be closed in this sub-population.

Figure 21 Number of children vaccinated at FATA/Afghanistan border, Jul 16 – Feb 17

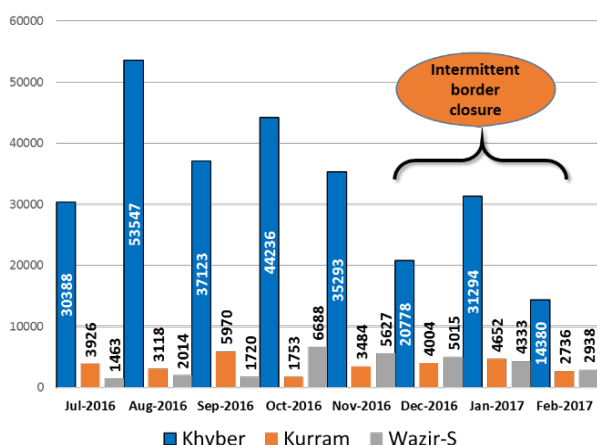
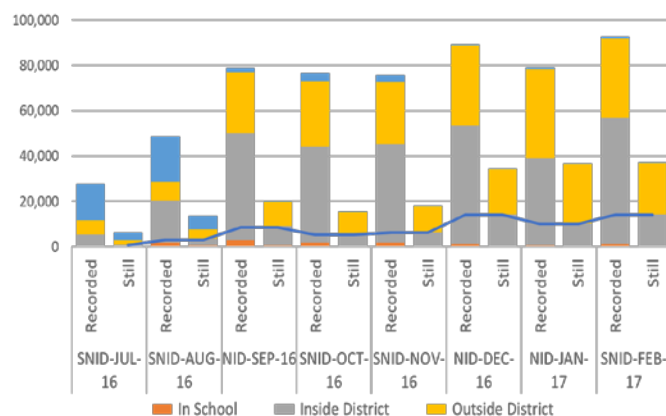


Figure 22 Number of NA by residence during campaign days, Quetta Block, Jul 16-Feb17



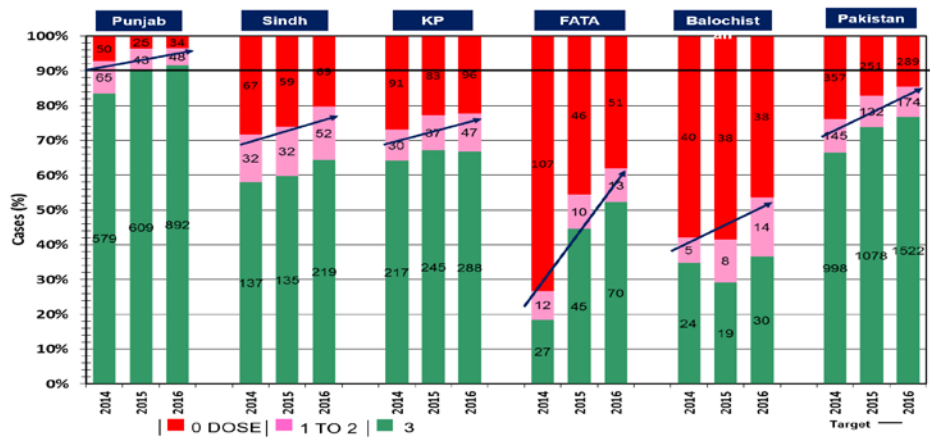
Routine Immunization

Performance of routine immunization remains below a level that will adequately control vaccine preventable diseases, including poliomyelitis. Measles outbreaks are occurring throughout the country with 5,697 cases reported in 2016 of which 2,703 were laboratory

confirmed. Seventy-nine percent of the cases were less than 5 years old and only 43% received at least one measles dose. Isolated diphtheria outbreaks in Punjab, Khyber Pakhtunkhwa and FATA further demonstrate the general poor routine immunization coverage, including in Tier 1 districts.

OPV vaccination status (R.I.) for non-polio AFP cases aged 6-23 months clearly improved in all provinces between 2014 and 2016 but the proportion of zero dose children is still too high (except for Punjab) to significantly decrease the susceptibility to polio in the cohort of children under 2 years (Figure 23).

Figure 23 OPV (R.I.) vaccination status of non-polio AFP cases aged 6-23 months by province, 2014-15



Preliminary survey results indicate that the NEAP target of achieving 80% coverage for Pentavalent 3 and IPV1 in CBV areas was also not achieved (Figure 24). In Karachi, of the zero-dose children identified during each campaign by CBV and referred to EPI, maximally 40% are reported having been covered (Figure 25).

Figure 24 Routine Immunization survey in children under one year of age, Khyber, March 2017

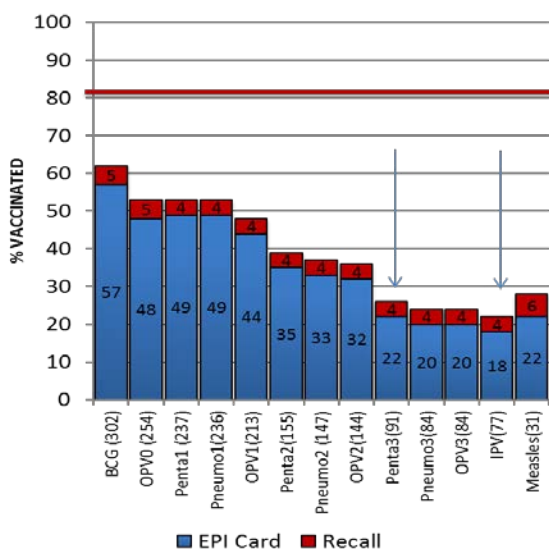
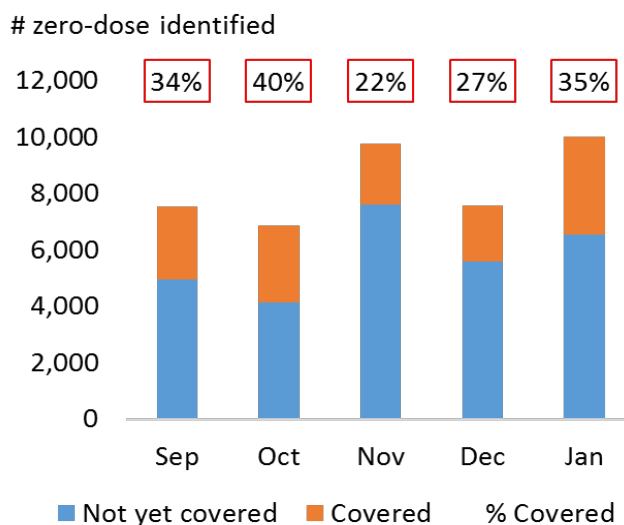


Figure 25 Zero-dose children referred by CBV for routine immunization, Karachi. Sep 16- Jan 17



Issues which pose challenges to the EPI progress are lack of skilled motivated persons to deliver vaccination, inadequate quantity and non-functionality of cold chain equipment, stock-outs due to sometimes insufficient vaccine management, and lack of funding for outreach sessions, coupled with administrative issues beyond the scope of this report.

Although new investment is expected for cold chain equipment, vaccines, operational costs and filling of vacant vaccinator positions, this will not be available soon to the union councils in Tier 1 and remote Tier 2-4 districts.

Conclusions

Overall

TAG acknowledges the impressive progress made by Pakistan programme since its last meeting in June 2016, and a near-to-complete implementation of its recommendations.

The overall decreased genetic diversity along with reduction in number of WPV cases, the low proportion of positive environmental samples and the much-reduced transmission patterns in Peshawar and Karachi justify the hope that interruption of transmission will be accomplished by the end of 2017.

Progress has been made in two of the three core reservoir areas. Quetta block has emerged as the new WPV1 hub, while local transmission is yet to be interrupted in Peshawar despite good performance and intensified efforts. Karachi had been able to interrupt transmission for seven months but is now showing again local transmission (Machar Colony, UC4 Gadap) after importation of virus from South Afghanistan.

The shift of cases from Tier 1 to Tiers 3-4, observed since mid-2016, continues into 2017. It reflects both, success in the core reservoir areas and continuing suboptimal performance of mobile teams in Tiers 3-4 where monitoring and supervision is often inadequate. TAG believes that by paying attention to the operational basics and the additional supervision and monitoring of mobile teams, interruption of virus circulation can be achieved – this is supported by the epidemiological evidence that Tiers 3-4 do not have the potency of establishing circulation as Tiers 1-2.

TAG congratulates the program on the continuous improvements made in all fields of surveillance. The June 2016 recommendations were fully implemented and brought the system several steps closer to being “fit for eradication”. But every step closer to eradication will require additional work on surveillance.

Balochistan

TAG takes note of the dual battle that the team in Balochistan had to fight against both WPV1 and cVDPV2 in recent months. The program managed to conduct strong VDPV2 responses back to back with densely scheduled bOPV campaigns. This is a remarkable achievement and demonstrates the kind of organizational commitment that will be required

for complete interruption of transmission. TAG also notes the continuous strong personal commitment of the Chief Secretary and his staff in leading PEI.

Interrupting the ongoing transmission in Quetta block remains the key challenge for Balochistan. Even in the absence of human cases, the continuing positive environmental samples and the exportation of local virus to other parts of the country is worrisome. With the current force of infection, TAG fears the consequences of continued transmission in Quetta block and South Afghanistan. Transmission in this corridor has a real potential of posing formidable challenges for both countries and re-infecting otherwise polio-free areas.

While Quetta itself has shown some recent improvements in overall campaign quality, this is not yet the case for Killa Abdullah and Pishin. With CBV expansion now fully completed, the systems and tools are all in place to conduct high quality activities throughout the block. The lessons learnt from the other two CBV operations in Karachi and Peshawar should be studied to improve and demonstrate the efficacy of Quetta block's CBV. Quetta block has been able to interrupt transmission several times –albeit with a much lower environmental surveillance network in place.

Of concern are the high number of children remaining unvaccinated because they are absent from their districts during campaign days. Missed children data show that many of these children are still in Quetta block where they can, and should be tracked and vaccinated. The operational need here is for a more integrated approach between transit and residential vaccination strategies.

TAG is cognizant of the fact that the performance of the mobile teams in Tier 3-4 districts remains suboptimal and without improvement, these areas will become more susceptible to infection over time. It remains possible that outbreaks may eventually occur if transmission is not soon controlled in Quetta block.

FATA

Progress in FATA has been impressive and steady. Fully inaccessible areas are fewer than ever before: only 6,000 children cannot be vaccinated in parts of Khyber Agency and South Waziristan. With the unfailing commitment of the armed forces, children in other insecure or partially accessible UCs could be vaccinated in door-to-door campaigns. Campaign quality is reportedly very good and the tracking and vaccination of mobile children strong. This is important as heavy population movement to and from Afghanistan continues unabated, especially on informal routes between South Waziristan and the Paktika region of Afghanistan from where seven WPV cases were reported since January 2016.

While mostly accessible to vaccination teams, some of the areas– notably in Khyber, North and South Waziristan, FR Tank, Mohmand, Bajour and Orakzai agencies- were not always open to external supervisors and monitors. On several occasions, random clusters for “healthy children sampling”, LQAS or PCM needed to be replaced because the areas chosen were inaccessible to them. In Bara and Jamrud tehsils, planned sero-surveys could not be conducted even though access was possible in the adjoining areas of Town 4 of Peshawar. So, the thoroughly good performance reports in FATA come with the asterisk

that monitoring and evaluation activities could not always be undertaken as planned, and that performance bias cannot be entirely excluded.

Despite considerable efforts, the number of females in the program— both in mobile teams and in CBV - remains rather low (19%).

Khyber Pakhtunkhwa (KP)

TAG notes the considerable progress that has been made in KP since June 2016. TAG appreciates the continued and systematic improvement in programme quality and the focus on the integrity of the data collected. In-depth investigations were conducted by both provincial and federal teams to understand the situation surrounding the positive environmental samples in Shaheen Muslim Town of Peshawar. Despite the major reduction in the number of circulating lineages, the persistent presence of WPV1 throughout the low season highlights the continued challenges posed by Peshawar.

The strong case responses in South KP of last year seem to have raised population immunity to a point where virus from neighboring south FATA/Bermel is now less likely to re-establish itself. However, South KP still faces the challenge of pockets of persistent refusals as well as imperfections in service delivery.

Sindh

TAG congratulates the Sindh team on having shut down Karachi as a WPV hub, and on the solid and sustained progress made in the Tier 2 districts of North Sindh. Both Karachi and North Sindh were still of major concern when the TAG met last year and in both places, the epidemiological and programmatic situation appears much improved. Still, the increasing number of missed children due to refusals in Karachi, even if largely in areas with good socio economic profile and educated population, needs to be dealt with. The quality of mobile team operations in non-CBV areas is still a substantial concern and threat to major gains made. While Karachi may no longer be a WPV hub, it is a centrepiece in the polio epidemiology of Pakistan and will be under constant threat of reinfection until eradication has been achieved.

TAG believes that in South Sindh more is required before it can be safely concluded that transmission has been interrupted and immunity levels been sufficiently raised to resist reintroduction of virus.

Punjab

The Punjab government remains highly committed and the program continues achieving good results in the most populated province of the country. The recent WPV from Lodhran was a wake-up call but should not deter the program to stay its course and work on improving the operational gaps leading to inconsistent and/or sub-optimal SIA performance, particularly in Rawalpindi and Lahore, and some poor performing Tier 4 areas (Sargodha, Jhang, Hafizabad). It is essential that Punjab takes the Lodhran case as a spur to continue

its historic leadership on polio eradication in Pakistan, and not as a cause for demoralization.

High risk mobile population movements remain an ever-present threat to eliminating wild poliovirus circulation in Punjab. These populations need to be continually identified and appropriate measures taken to vaccinate them. Furthermore, “bigger cities attract bigger problems” and the epidemiology of the twin cities Islamabad and Rawalpindi suggest a tougher battle that the province must face in the days to come.

Recommendations

Pakistan polio eradication remains on track. Currently, TAG does not see the need for recommending any major re-adjustments or ‘innovations’. The strategies and tools available to the program have been effective where fully applied.

While there are a number of challenges ahead for the program, the principal ones are (1) stopping transmission in the core reservoirs; (2) continuing pressure to maximize quality of SIA coverage in critical CBV and mobile team areas and (3) identifying and covering high-risk mobile populations to prevent further spread.

Tiers

The overarching priority for the program is to maintain relentless focus on the core reservoir areas, ensure that transmission is interrupted and once achieved, to maintain this status.

TAG regards ongoing transmission in Tier 1 as the greatest risk to polio eradication in Pakistan. Fewer WPV cases and the recent progress in the core reservoirs do not change this assessment. TAG strongly recommends that the program resists any activities that distract from keeping the spotlight on Tier 1. With a fully implemented CBV program and a wealth of data available to guide interventions, interrupting transmission in these critical areas should be achievable soon.

In Tier 1 areas with mobile teams—89 UCs in Karachi and 4 UCs in Killa Abdullah—further effort will be required to improve performance, i.e. by continuously trying to increase the number of local females in the teams, by re-focusing on gaps in micro-planning and by driving down to a minimum all ‘still missed children’ during and after SIAs, including but not limited to sub-categories of ‘mobile/guest, and ‘persistently missed.

In Tier 2, mobile team performance should be further strengthened, particularly through appropriate selection and training of local females. TAG believes that getting the composition of the vaccination teams right - i.e. at least one local female in the team – will solve many operational issues such as otaque vaccination, identifying and vaccinating all children in each household., increased same day coverage and conversion of refusals. This

improvement in team composition together with effective monitoring and supervision would suffice the needs.

Addressing the existing performance gaps in **Tiers 3 and 4** is a formidable challenge because of its size, not because of the complexity of the problems. TAG believes that full adherence to basic operational principles would result in acceptable campaign quality but acknowledges this may not be implementable on a full scale given the other priorities and the smaller number of human resources available in these areas.

TAG recommends that the provincial programs continue identifying persistently low performing Union Councils in Tiers 3-4, conduct in-depth analyses of their problems and offer them support tailored to their needs. Key NEAP indicators should be closely monitored for any impact, including the number of local female team members.

To mitigate the risk of inadequate local response, all relevant polio events in Tiers 3-4 require rapid investigation and competent intervention. TAG recommends that the national and provincial programs further build on the Rapid Response Team (RRT) concept, regularly review their capacities and ensure that any required support is provided of high quality and in good time. The RRT needs to be made “more robust”.

Provinces

Balochistan

- Sustain the recent gains in Quetta block and further build on them. Killah Abdullah and Pishin need to raise their performance levels. Persistent transmission in these two poses a huge threat and needs to be addressed with urgency.
- Use all available information on still missed and persistently missed children to identify and address potential clustering, with special focus on “out of district” children.
- Maintain a strong focus on tracking and vaccinating all HRMP children.
- Increase, as resources allow, the proportion of micro plans undergoing field validation with a particularly emphasis on Tier 4 areas.

FATA

- Sustain current gains.
- Continue exploring ways to gain access to children living in the still inaccessible areas of FATA.
- Verify the status of “vacated” areas.
 - Ensure that returnees are systematically tracked and vaccinated. Consider vaccinating children under five years of age with IPV, supplies permitting.
 - Further map informal border crossings with Afghanistan and develop plans to vaccinate children at these crossing, or in their own communities.

- Continue efforts to increase the number of local females in vaccination teams.
- Enhance monitoring in security-compromised areas, as feasible
- Promote the use of female monitors.
- Review monitoring data and map areas where PEI supervision and monitoring activities were not consistently possible. Develop an “inaccessibility map” that clearly highlights the different access levels in FATA.
- Ensure local coordination mechanisms are in place across the border with Afghanistan.

Khyber Pakhtunkhwa

- Address any remaining performance gaps in
 - Greater Peshawar, i.e. Peshawar, Mardan, Swabi and Nowshera: Ensure that persistently missed children are mapped and vaccinated. In non-CBV areas, target trainings to address issues identified in preceding rounds, and improve monitoring and supervision.
 - Northern belt, i.e. Mansera, Haripur, Battagram, Kohistan and Shangla: Maintain focus on these remote areas to ensure the basic elements for quality campaigns are in place, including local females in teams, and supportive supervision.
 - South KP. Address the issue of refusals through coordinated efforts of social mobilization and community engagement, coupled with good planning and execution in operations.
- Address the surveillance gaps observed in Kohistan, Swat and South KP. Ensure surveillance indicators meet the standards, and silent Tehsils are identified.

Sindh

- Karachi
 - Continue treating all of Karachi as Tier 1 and ensure all high-risk areas are covered during each and every SIAs. For SNIDs, carefully reduce the target in the so-called posh areas where frequent campaigns seem to have caused a high number of refusals. Err on the side of caution.
 - Continue addressing the high number of refusals and still missed children in high risk CBV areas through special community engagement activities.
 - Improve campaign quality in mobile team areas by recruiting more local females into the vaccination teams and ensuring that they can be retained. Continue engaging professional associations, major hospitals and private health care providers in assisting to overcome overt and silent refusals in posh areas.
 - Ensure the transition from FCVs to CHWs will be minimally disruptive and not affect the quality of the activities. Again, err on the side of caution.

- South Sindh
 - Increase the number of local females in teams.
 - Ensure an adequate number of HR from government and partners.

Punjab

- Strengthen the continuous mapping of high-risk mobile populations and ensure their vaccination.
- Address operational gaps in Rawalpindi.
- Remap high risk UCs.
- Synchronize SIAs with Islamabad.

Islamabad

- Together with Punjab, establish a twin city taskforce. Develop a joint action plan and set indicators for progress.
- Address operational shortcomings, particularly in the management of the workforce and the shortage of medical officers. Increase the number of local female team members.
- Keep a focus on consistently poor performing UCs.

High Risk Mobile Populations (HRMP)

- Standardize, and lay out a common plan for HRMP data collection and analysis to provide an inter-provincial, country-wide overview of HRMP and their movements – by June 2017.
- Ensure regular sharing of data on priority mobile groups between provincial EOC HRMP focal points.
- Prioritize districts and UCs at greatest risk of HRMP-related transmission.
- Field-validate micro plans for their regular inclusion of HRMP and their update before each SIA. Prioritize districts.
- Correlate HRMP movements with ES drainage sites/results to map geographic coincidence of population and virus movement and identify very high risk types of mobility.
- Continue the existing process of identifying guest/mobile children:
 - Stratify UCs according to risk related to guests/mobile movements.
 - Ensure vaccination teams identify and vaccinate guest children.
 - Continue tracking the final destination of returnees. Prioritize districts/areas receiving returnees to validate that SIA micro plans include these groups.
- In response to a question posed to the TAG, at this stage, the TAG does not recommend vaccinating higher age groups of HRMP.

Common Reservoirs

TAG highly appreciates the continuing close coordination between Afghanistan and Pakistan programs. The general recommendations from the June 2016 meeting are still valid, i.e. coordination at all levels, information sharing, joint risk assessment & response, and SIAs synchronization. However, as eradication moves into the final stage, seamless coordination across the common epidemiological block becomes ever more critical to success in both Pakistan and Afghanistan.

TAG adds the following, more specific, recommendations:

- In common/endemic reservoirs:
 - Jointly analyse the information available to each of the national programmes and develop **specific actions** to better reach populations who move along the endemic corridors.
 - Ensure that synchronization of campaigns is even more closely coordinated to minimize the risk that families moving along the corridors are missed. Map and share data on HRMP movements and their coverage.
 - Organize and standardize information on ‘guest’ children and families to understand who moves along the corridors when, what the points of departure and the destinations are, and how these can be best covered.
- For border communities
 - Conduct a detailed joint analysis (province by province, district by district) of potentially unreached children in communities close to or straddling borders, where they are, what relationships exist between communities on both sides of the border, and their (in)accessibilities. Link this data between the two programs.
 - Based on the findings of the analysis, consider special immunization activities for particular local areas, and/or placement of permanent transit teams.
- For nomads and seasonal migrants
 - Compile a **comprehensive overview** of all nomadic groups and seasonal migrants, their characteristics, routes of movement, seasonality of movement, stopping places, etc.
 - Pool information on groups that move across the international border, and ensure that the full annual movement patterns are understood and mapped.
 - For each nomadic group or seasonal migrant group, develop an HRMP plan at appropriately localized levels.

- For returnees, repatriated refugees
 - Develop clear plans for both programs on opportunities for immunization of returnees; plans should be closely coordinated with local authorities and with involved agencies (especially UNHCR and IOM).

Surveillance

- NEOF: Develop a protocol for contact sampling of AFP cases in remote areas of Balochistan, and the mountainous areas of North KPK and Gilgit-Baltistan.
- NEOF: Utilize existing protocols to take additional “healthy-children” stool samples in the highest risk areas of the ES catchment area of Shaheen Muslim Town to attempt further localization of transmission.
- Continue efforts in involving the private sector in AFP surveillance, particularly major private hospitals and professional associations.

Routine Immunization

The routine immunization program requires immediate attention but it may not be feasible to improve the program fast enough to significantly contribute to the critical progress towards polio eradication.

TAG believes any acceleration of routine immunization through crash programs will not bring about a sustainable change and may also be of little use in maintaining adequate immunity levels after polio transmission has been interrupted and the frequency of SIAs been reduced.

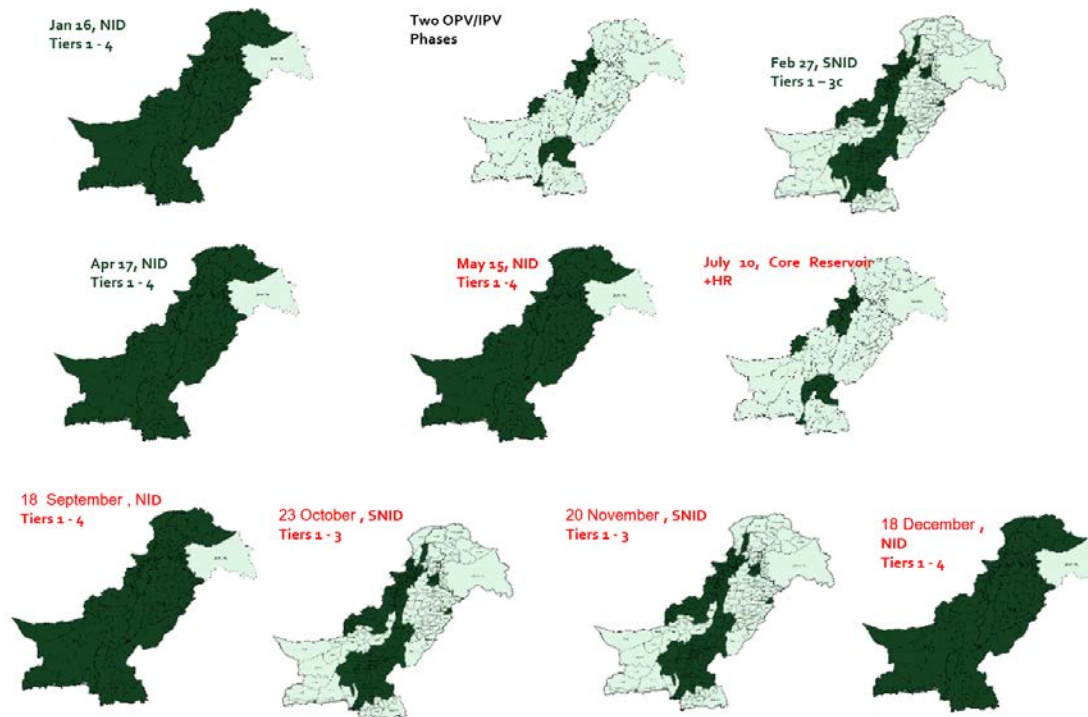
TAG recommends the following:

- Concentrate on increasing, in a sustainable way, the quality and quantity of routine immunization service delivery, vaccine management and cold chain maintenance.
- The polio workforce to continue assisting with micro-planning; monitoring service delivery and vaccine stocks during regular field visits.
- In Tier 1 areas, CBV to continue identifying and referring zero dose children, and assisting with line listing of measles outbreak cases when encountered in the course of their field work.

SIAs schedule

The TAG endorses the **SIA schedule** of four NIDs and three SNIDs between April and December 2017 (Figure 26). Depending on the evolving epidemiology, it recommends to maintain flexibility about the extent of the July round.

Figure 26 Schedule of supplementary immunizations activities in 2017



Management and oversight

TAG highly appreciates the sustained and strong commitment to PEI at all levels of Government. The oversight mechanism through the task forces at national, provincial and divisional levels have been very effective. The pivotal role of Deputy Commissioners in leading polio activities at districts cannot be overstated, and the universal application of the accountability and performance management framework has started bearing fruit.

The importance of sustaining this high commitment is self-evident and a *sine qua non* for achieving interruption of transmission by the end of 2017. This is particularly relevant in light of the 2018 national elections, the preparation of which will undoubtedly pose many additional demands on key government staff involved in PEI.

As stated in previous reports, the transfer of well performing key officials should be avoided, particularly until the end of the low transmission season but preferably to the end of 2017, to ensure continuity of operations.

EPI engagement in PEI needs to be reinforced as per NEAP so that the vaccination targets in the CBV areas can be achieved, as was asked for by the Prime Minister's Focus Group. In all other areas, TAG recommends taking a progressive, sustainable approach to improving EPI instead of a crash approach.

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