



INDEPENDENT MONITORING BOARD
OF THE GLOBAL POLIO ERADICATION INITIATIVE

**EVERY LAST
HIDING PLACE**

15

FIFTEENTH REPORT: DECEMBER 2017



INDEPENDENT MONITORING BOARD

OF THE GLOBAL POLIO
ERADICATION INITIATIVE



The Independent Monitoring Board (IMB) provides an independent assessment of the progress being made by the Global Polio Eradication Initiative (GPEI) in the detection and interruption of polio transmission globally. This report follows the IMB's meeting held in London on 31st October and 1st November 2017.

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The IMB's reports are entirely independent. No drafts are shared with the Polio Programme prior to finalisation. Although many of the data are derived from the GPEI, the IMB develops its own analyses and presentations.



INTRODUCTION



This is the 15th report produced by the Independent Monitoring Board (IMB) of the Global Polio Eradication Initiative (GPEI). A separate independent monitoring board (the Transition Independent Monitoring Board, TIMB) reviews progress with the task of planning and implementing measures necessary to secure a completely polio-free world. It also examines actions aimed at ensuring successful transfer of polio assets, innovations developed and lessons learned to countries' public health programmes and other global health priorities. The TIMB's second report will be published shortly.

The IMB's evaluative judgements focus on objective one of the GPEI Strategic Plan 2013-2018: "*Stop all wild polio virus transmission by the end of 2014 and new vaccine-derived polio virus outbreaks within 120 days of confirmation of the first case*". The 2014 date for interrupting wild poliovirus transmission was (by implication) modified when the Polio Oversight Board meeting endorsed an "intermediate" scenario whereby global transmission would be interrupted by the end of 2016. The Polio Oversight Board also reviewed a scenario whereby transmission would be interrupted by the end of 2017. This was rejected as "pessimistic".

This 15th report of the IMB follows a meeting in late October and early November 2017 with GPEI staff, donors, extended partners, together with health ministers and officials from Pakistan, Afghanistan and Nigeria.



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The IMB recognises the dedication and hard work of leaders and staff of the Polio Programme in many countries and at global level. The IMB particularly commends the courage and commitment of frontline vaccinators, social mobilisers and other public health staff who often work in complex and dangerous environments to deliver the goals of the Polio Programme. Whilst good progress is being made, the final stage of the journey to eliminate polio transmission globally is proving extraordinarily difficult. A step-change will be required for success in the last frontiers. The poliovirus is surviving despite all the good work and in the face of everything that is being thrown at it. In their presentations to the IMB members, the GPEI leaders stated the belief that the Polio Programme is close to eliminating transmission of wild poliovirus, but not close enough, not at the end, and still facing challenges. They also expressed confidence that they had a good understanding of what the problems are. The GPEI representatives at the IMB meeting described the problems as related, with distinctions by countries, to: *inaccessibility*, notably in parts of Afghanistan and in north-eastern Nigeria; to *weaknesses in the quality* of the programme in places; and to *fatigue*, particularly in Pakistan and Nigeria. The leadership of GPEI also conceded some uncertainty and differences of opinion on the “how to do it”: how to improve quality; how to track and reach those mobile populations that remain impenetrable; and how to overcome some of the

fatigue problems that are proving such a concern at this stage of the eradication effort.

Poliovirus circulation remains a public health emergency of international concern. The Director-General of the World Health Organization (WHO) declared this status in May 2014. An emergency committee has been meeting every three months since then. It has reiterated that the risk of circulation of wild or vaccine-derived poliovirus remains a public health emergency of international concern. The new leadership at the helm of WHO should restate the sense of urgency to finish polio.

Between the 14th IMB report (based upon data up to 31st May 2017) and its recent meeting (based upon data up to 25th October 2017):

- There were **7** new cases of wild poliovirus
- There were **58** new cases of vaccine-derived poliovirus
- There were **52** wild poliovirus-positive environmental samples
- There were **38** vaccine-derived poliovirus-positive environmental samples

Since the IMB meeting and now (based upon data up to 22nd November 2017):

- There has been **3** new cases of wild poliovirus
- There has been **19** new cases of vaccine-derived poliovirus



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- There has been **17** wild poliovirus-positive environmental samples
- There has been **4** vaccine-derived poliovirus-positive environmental samples

Taking an overview of the epidemiological situation in the three endemic countries:

- In Peshawar, no wild poliovirus cases had been reported in 2017. No positive environmental samples had been isolated there since June 2017. However, during the IMB meeting, one wild poliovirus-positive environmental sample was confirmed on 1st November 2017.
- There is thus evidence of indigenous transmission in all three core reservoirs, in the cross-border corridors, as well as outside core reservoir areas.
- In Afghanistan, there is evidence of ongoing local transmission in Kandahar and Helmand whilst there is more recent transmission in Nangarhar.
- Despite the lack of any cases or environmental isolates of wild poliovirus or vaccine-derived poliovirus in Borno, Nigeria, so far in 2017, a high number of children (estimated 162,000-230,000) remain unreached (though this number is down from six months ago with limited or no surveillance to determine whether polio is present).

Two countries are affected by outbreaks of vaccine-derived poliovirus, and (based on data up to 22nd November 2017):

- In Syria, the outbreak of vaccine-derived poliovirus has resulted in 70 cases and has been going on for 169 days.
- In the Democratic Republic of Congo, two outbreaks have generated 10 cases of vaccine-derived poliovirus and they have been going on for 183 days.

Overall:

- The Polio Programme could, in theory, interrupt wild poliovirus transmission by the end of 2017 (in line with the "pessimistic" planning scenario). In practice, this deadline looks unrealistic.

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The IMB endorses the approach of the GPEI that Pakistan and Afghanistan continue to be regarded as one epidemiological block, with poliovirus corridors that span the two countries. This requires continuing concrete action by the Afghanistan and Pakistan governments to work cooperatively and, in particular, to secure strong cross-border arrangements for polio vaccination. However, it is also important that neither of the two countries come to believe that continuing poliovirus circulation is due to weaknesses in the work of their counterpart. Each country has poliovirus transmission within its own national boundaries and, in each, low vaccination rates in vulnerable populations create weaknesses that enable polio to spread. Current programme performance has not reached the level necessary to clear wild poliovirus out of either of these two endemic countries. The lack of a transformative solution for an inaccessible large, high-risk mobile population, potentially moving poliovirus across and between the two countries, is a particular concern.

Strong visible national and provincial leadership in Pakistan

The IMB continues to be impressed with the political commitment from the Government of Pakistan to end wild poliovirus transmission. The Prime Minister is taking an encouragingly hands-on approach. He chairs regular National Task Force meetings, as well as conducting fortnightly meetings with leaders at the provincial level. It

is impressive how one highly active Provincial Secretary took to the streets himself to personally deal with refusals. The Polio Programme needs to see more of this sense of exceeding expectations. Strong political support has been necessary to urgently strengthen workforce capacity; for example, limited effectiveness of health workers in Islamabad was identified as a problem and a decision to appoint more effective staff has been taken. Again, it is an example where identifying a root cause of weak performance and taking decisive action to address it can be pivotal in achieving a breakthrough. Upcoming national elections also present a potential disruptive risk to sustained commitment.



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Visa debacle

A barrier to the performance of the Programme in Pakistan has become evident in delay and rejection of visas for 22 external polio consultants. In one case, the Ministry of Foreign Affairs denied a key WHO team leader entry into one of the territories of his assignment. Lack of absolute political and administrative alignment to the goals of the Polio Programme, and any whiff of absence of “can-do” mind-set, will prevent Pakistan getting over the finish line. This regrettable bureaucratic process failure could cost Pakistan its international reputation, if it contributes to an outbreak of poliovirus.



Continuity after elections

Elections are coming in Pakistan in 2018. At the time of the last national elections in Pakistan in 2013, the whole Prime Minister’s polio cell was dismantled and this caused immense confusion and anxiety about what would happen to the Polio Programme. This was primarily because the Ministry of Health’s functions were devolved. This was a highly disruptive period for the Polio Programme in Pakistan. For a time it appeared leaderless and key polio staff throughout the country were described as: “Actors in search of a play”.

At the IMB meeting, the Minister of Health of Pakistan reassured the board that the Polio Programme is apolitical. Not only political parties, but also all institutions and law enforcement agencies, are, in her words, “On the same page”. She said that the polio team, including the Prime Minister’s Focal Person, staff at the Emergency Operations Centres and the Provincial Secretaries, are very likely to remain the same. The three main political parties, and some religious parties, in Pakistan, are fully aware of the importance of the Programme. This time the government will have an interim set-up period of almost 90 days, to ensure a smooth leadership transition. The Minister emphasised that Senator Ayesha, the Prime Minister’s Focal Person on Polio Eradication, will not be affected because the Senate will not be part of this forthcoming round of elections. This stability is reassuring. It must be delivered.

There are three distinct, ongoing circulations of poliovirus in Pakistan.

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Balochistan

In Balochistan, repeated wild poliovirus-positive isolates in Quetta Block signify a worrying source of ongoing transmission. Security in Quetta Block remains volatile. Killa Abdullah was repeatedly discussed during the IMB meeting. It is one of the most challenging polio environments in the whole world. The security situation is very difficult. Just two months ago a district police officer was killed. It is so complex that even moving existing national staff around, even to get international staff to go there, is extremely problematic. It is a border town and a hub of insecurity, illicit activities, and community resistance.

Designing a programmatic response to achieve performance excellence there seems to be defeating everyone. Even the tried and trusted management strategy of sending the best people to the most difficult places is out of reach. It is hard to entice people there. More than one person said that, for the brightest and best of polio managers, to be posted to Killa Abdullah was the modern day equivalent of being sent to, *"The salt mines of Siberia"*.

The provincial team in Balochistan responded to the IMB's concerns with an upbeat message about Killa Abdullah. It emphasised the need to focus mainly on the Chaman subdivision of Killa Abdullah. This district borders with Afghanistan and has 14 union councils within its boundaries. It also produced the highest number of polio cases for any administrative subdivision in Balochistan. The Balochistan team said that its message to the IMB and to



the world was, *"If Chaman is controlled, Killa Abdullah is controlled. And if Killa Abdullah is controlled, Quetta Block is controlled"*. Indeed, since 2011, 70% of polio cases in Quetta Block have been in Chaman. However, historically in other parts of Quetta Block it has also been very difficult to eliminate transmission, so it is important not to fix attention solely on Killa Abdullah.

The team pointed to the beneficial growth of community-based vaccination that in 2015, replaced the previous arrangement of staff hired on a monthly basis, which was said to be: *"Going nowhere"*. The community-based vaccination programme has needed time to become entrenched and effective but is now a uniform system all across Chaman. In September 2016, there were 1500 vaccine refusals in Chaman. The team reported to the IMB its work

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on community engagement. They started talking with and engaging elders, religious leaders and religious support persons. They also have taken action against those people who were deliberately trying to sabotage the Programme for no legitimate reason. They point to the reduction in the number of refusals, down to below 400 in Chaman.

The proportion of female community health workers has been increased to 88% in Chaman. They have access to the houses (especially those in villages on the border). They can find the missed children and the children who are being deliberately hidden. A special conference is held with Afghanistan and the border team every week. However, there are around 80,000 children under five years of age in a congested area between the border and Khojak Pass (a mountainous area). On a given day, 10,000 to 15,000 people

in high-risk mobile populations are crossing the Friendship Gate at Chaman. This is a key crossing between Pakistan and Afghanistan. These populations are now being targeted for vaccination.

Quetta Block has below 30% routine immunisation coverage and Balochistan overall is below 20%. Whilst the priority is to reach populations with oral polio vaccine, routine immunisation can play an important part. Balochistan is a large territory, the size of Germany roughly, with a population of 12 million. For 17 union councils in the districts of Quetta, Pishin and Killa Abdullah, the Provincial Government has enhanced the capacity of their routine immunisation workforce with community based volunteers. This started in August 2017. The Government of Balochistan is also adding 1000 community health vaccinators (they will mostly be women) and 300 technicians to give injections. It is hoped that these actions will improve routine immunisation in the Quetta Block.

Karachi and wider Sindh

The re-establishment of circulation in Karachi after importation from southern Sindh and the southern corridor has set back the Programme. Karachi was free of poliovirus for parts of 2016 then was re-infected. Now there is intense transmission. It is a place that has traditionally seeded virus to other parts of Pakistan. The Government of Pakistan attributes the decline in its performance to the massive movement of population into and within Karachi (the largest epidemiological block in the country). People come in not

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only from the core reservoirs of Pakistan, but also from Afghanistan. The government also considers that most of the problems are concentrated in 25 out of 188 of the union councils of Karachi. They are attempting to track and identify the high-risk mobile populations and engage the community, which has not welcomed vaccination efforts. There are multiple factors driving resistance from the community. One is campaign fatigue. The frequency of the campaigns, especially in some of these areas, has produced a backlash. Two, the populations reacting negatively to the vaccine largely live in slum areas, where amenities, the civic services, which should be provided by the government, are almost non-existent. These populations ask why such a focus on polio? Why not on other health services? Why not on other, civic services which the government could provide?

The Provincial Secretary has been advised about this situation and the local government department in the Government of Sindh has been asked to come up with a strategy to find solutions for these underserved populations in most of the high-risk union councils of Karachi. More staff (in particular, 500 medical officers) to work only in Karachi, on polio and routine immunisation, has been provided by the Government of Sindh. A surge of partner staff in the high-risk union councils of Karachi has added to the intensity of effort. In addition, high calibre staff have been appointed to posts in the most critical places. Experimental dispensaries are being established in Karachi's underserved population areas (25 sites have been selected). The Sindh polio eradication team is particularly focusing on the children who are persistently missed.

The key challenge for Karachi, given its population density and population movements, is to sustain an extremely high level of engagement, not just for this upcoming low season, but also for the countdown to certification. The Government of Pakistan is working on specific strategies to ensure mechanisms are in place to manage and address political, administrative, community and team fatigue.

The twin cities

A third hotspot is the twin cities of Islamabad and Rawalpindi where the virus has found a new home. Isolates from Islamabad and Rawalpindi mean that there is transmission outside the core polio reservoirs. The transmission "ping-pong" between the twin cities extends to the province. The Pakistan Polio Programme leadership described Islamabad as, "*Our Achilles heel for some*



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time now”. Islamabad is the capital city and has affluent residential areas but it also has slum areas. The Polio Programme has not been reaching around 11 slum areas. Despite major efforts, the virus has stubbornly persisted among communities in Islamabad and neighbouring Rawalpindi. Slum areas, with high population density and highly mobile populations, have a high turnover of staff during vaccination rounds. Parts of the municipal services provision in the capital are especially vulnerable in that they have some difficulties with the management and accountability of government workers. A new Islamabad and Rawalpindi coordination taskforce has been established by the Prime Minister and is now striving to get ahead of these issues. Action taken by the government is improving programme results in the twin cities through better coordination, direct oversight and additional support

to Islamabad. The challenges of a fragmented health infrastructure and concerns over the lack of a permanent workforce in Islamabad have been addressed with a pledge to assemble a joint task force and to hire permanent staff. There have been more than 240 hired so far, alongside supervisors appointed by WHO.

Despite this activity, the environmental data for Islamabad and its twin city should have led to stronger action earlier. Similarly, environmental sampling for Karachi has shown that, every month, the poliovirus was isolated since the beginning of the year. Again, the reaction should have been faster. Pakistan is now, rightly and appropriately, considering those environmentally detected polioviruses as if they were cases and reacting accordingly. Yet, missed opportunities for early decisive action risks the poliovirus re-establishing one of its old strongholds.

FATA

Three years ago, FATA (Federal Administered Tribal Areas) was a huge challenge for polio eradication in Pakistan. In 2014, and going back, some 350,000 children could not be reached. The news from there is much more positive. Now the figure is less than 800. The current challenge is to sustain progress. There are still big security problems in North Waziristan and South Waziristan. Looking at the results of the last year, FATA has not seen a polio-confirmed case for more than a year now. If South Waziristan is excluded it is nearer two years. Apart from South Waziristan, where there are not frequent,

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consistent campaigns, all benchmarks for supplementary immunisation activity and surveillance have been met consistently. FATA does not have any environmental surveillance sites.

There are still major risks arising from large-scale and cross-border movement. There are many routes to and from the South Waziristan Agency. Populations move at all hours and they move through informal routes. Frequent travellers go between Afghanistan and Pakistan. Long-range travellers move from Afghanistan via FATA to Khyber Pakhtunkhwa and Punjab. Reaching every child in such families is virtually impossible. However, the scale of inaccessibility is much less than it was.

IMB sources recounted that a group of highly mobile children from an external community were playing within one district, but the vaccinators did not approach them during the vaccination round as they claimed they are not children from their district. The misguided and pedantic action of the vaccinators on this occasion shows the importance of training and leadership of teams. It also emphasises the need to create a communication strategy where *Every Last Child* is not just a slogan for glossy fund-raising brochures, but also the organising principle of all local teams and of every staff member and volunteer.

Strong Afghanistan Government leadership

The IMB was impressed to hear about the commitment and leadership from the Government of Afghanistan. The President of the Islamic Republic of Afghanistan personally chairs the meetings of the national steering committee, which improves the participation of the Chief Executive Officer, cabinet members, governors and provinces and polio partners.

The Polio High Council, which meets quarterly, brings together all nine ministries and departments to operationalise the decisions of the national steering committee and to address barriers and challenges faced by the Programme. All nine ministries and polio partners sit together to ensure that the Polio Programme gets their full, unified support.



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The Polio High Council has helped make polio a national programme, involving all sectors of society. With the support of these two political fora, the Emergency Operations Centre has developed a constructive partnership with all nine ministries. The Ministry of Hajj and Religious Affairs has helped the Afghanistan government to engage religious leaders and scholars in the Polio Programme. This has ensured that negative rumours and misconceptions about polio and the vaccine are quickly countered.

The Afghanistan Polio Programme has been notable in the past for innovating and coming up with new ideas to tackle polio. The IMB was particularly interested in two such initiatives. Firstly, as part of the Ministry of Health's partnership with the Ministry of Communication and Technology, the Emergency Operations Centre has access to the mobile telephone directories. This is helping the government to monitor campaigns in the areas that were otherwise difficult to access. Secondly, with the support of the Ministry of Education, students are engaged as community mobilisers, who also report to the polio teams on children who remain unvaccinated during the campaign.

Another strong feature of the government's role is its work to maintain programme neutrality to ensure polio workers are able to reach all parts of the country. It is important that the commitment to programme neutrality is continued. All Provincial Secretaries are providing support. The country's President receives monthly updates on the overall status of the Polio Programme and role played by the Provincial Secretaries.



These are positive signs of commitment but ultimately the government will be judged on the success of its programme in interrupting polio transmission.

The polio epidemiological zones in Afghanistan

The team running the Polio Programme in Afghanistan pointed out to the IMB that seven out of 10 polio cases in 2017 have been in the southern region, largely in Kandahar and Helmand. The team views their country as a series of polio epidemiological zones, each with different characteristics.

The north-east usually suffers transmission once in a while, and it is cleared off with a robust response. However, a recent transmission threatened a major outbreak, because it started in Kunduz that was inaccessible for 18 months,

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with 180,000 children trapped. With a robust response and strong negotiation, they managed to access this area and this did not give rise to any other case. A transmission in 2016 was not genetically linked to one in 2015, and that of 2017 was not linked to 2016.

Transmission in the south-east also comes occasionally, and again, it is usually cleared off quickly.

What is most worrisome is the south. Historically, transmission there is prolonged. For example, in 2014, it lingered for one and a half to two years. From the start of the 2014 outbreak, the last case was not until in April 2016. This year's transmission started in January, and it is still present.

Looking at environmental surveillance last year, for 11 months there were no positive environmental samples.

Then in November and December 2016, transmission was detected in the east as well as in the south. Thereafter, transmission has been detected in both the eastern region and the southern region. Looking at the genetic sequencing results of these positive environmental samples, some are not related even though they are being found at the same site. There are many separate genetic lineages.

There are orphan viruses in the east (Nangahar) and the north-west (Peshawar Corridor), which have long-chain transmission. Where is this virus hiding? There is currently no answer to this question. The Polio Programme in Afghanistan has analysed the subdistrict access status. In Nangahar, in inaccessible pockets there is a non-polio acute flaccid paralysis (AFP) rate of 25, which is quite high as compared to the surrounding area. In Kunar it is 25, and in Kandahar it is 10. So, even in those inaccessible subdistrict pockets there is a fairly robust surveillance system. However, the Polio Programme is engaging a third party to go to those areas and look for any recent polio cases or AFP cases.

Overall, the proportion of missed children has been reduced from 13% to less than 6%; that is even in Kandahar. There has been particular improvement in two components: children missed due to team performance (where the team did not visit or just missed) and reduction in absent children. The recent Knowledge, Attitude and Practices (KAP) survey by Harvard shows that there has been an overall improvement in vaccine acceptance and intention to vaccinate.

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In its strategy for the southern region, the Polio Programme is targeting 15 districts that have been responsible for 90% of the polio cases ever in this region. Nine of the 15 districts are in Helmand and six are in Kandahar. This amounts to a total target population of 1.1 million. In the past, when the transmission has been established in these 15 districts, it has invariably lasted for more than six months. The country's Polio Programme has termed them *focus districts*. There is a plan for them. It is part of a broader southern corridor action plan including neighbouring parts of Pakistan. A complex mix of problems besets the 15 districts: frequent periods of inaccessibility, problems of vaccine-acceptance, specific operational challenges and only fleeting interactions with the high-risk mobile population. There are serious limitations in monitoring campaigns. The Polio Programme in Afghanistan is trying to mitigate the risks of this weakness by three measures: by feedback of information from previously identified focal points; by engaging third parties (independent organisations that have capability to go to security compromised areas); and by remote monitoring using mobile technology random calls to numbers in high-risk areas (to get the information if a village was reached and if the respondent's child had been vaccinated or not).

Accessibility is so unpredictable in Kandahar that it is difficult to bet on success until there have been five or six months of accessibility. Highly mobile populations, such as the seasonal workers of the Pashtun communities in the east, mean that some children are not being reached by traditional methods of vaccination campaigns. There are small pockets of scattered, inaccessible and straddling populations and

returnees within the east and south-east region, mostly consisting of long distance travellers and nomads.

It is a strong feature of the Afghanistan Polio Programme that it appears to be good at detecting the virus even where access is restricted. The Polio Programme is able to achieve the standards of surveillance, detecting non-polio AFP rates as well as having percentage of stool samples that are adequately collected and sent to the laboratories.

The Polio Programme in Afghanistan is particularly affected by major geopolitical changes, including large-scale population movement. The most serious concern for the country Programme is deteriorating security in the southern region of the country and the pockets of children that are inconsistently reached.



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The Programme in the south of Afghanistan needs to initiate high quality programmatic action at each and every time an opportunity for access presents itself. The Programme may not always have control over access, but it should have control over performance.

Non-governmental organisations

In its last report, the IMB recommended a stronger role for the non-governmental organisations (NGOs) that are already delivering basic public health services, including routine immunisation, under contract in Afghanistan. The recommendation included the appointment of a new



coordinator from within the NGO community. These NGOs are the sole provider of health services in 31 out of 34 provinces in Afghanistan. The IMB view had been that this could be done in a way to add value and increase population immunity in Afghanistan. It could help the Polio Programme reach a tipping point. There was a very strong push back on this recommendation from the Polio Programme in Afghanistan. The government and the GPEI partners believe that they already have NGO engagement and coordination and that the proposal would be a distraction to polio eradication. When it comes to the future and polio transition, it would not be effective to run a Polio Programme in Afghanistan that is wholly parallel and separate from the routine immunisation system. The IMB cannot compel the Afghanistan Polio Programme to adopt a recommendation. What is essential is that NGOs and the government work together to achieve synergy by ensuring mutual accountability and sharing positive and negative experiences so that effective practices can be spread to more areas and ineffective practices can be reduced.

Cross-border synchronisation

One vital issue that is unarguable is the importance of synchronised campaigns between Pakistan and Afghanistan. This is agreed policy. The IMB was assured that it happens but IMB sources close to the ground report that it does not always happen. With a mobile population, lack of full synchronisation is pure folly. Similarly, when a polio case occurs, the same intensity of response must take place on both sides of the border.

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Pakistan and Afghanistan: Key observations

At this end stage of interrupting transmission globally, it is deeply disturbing that in 2017 nine long chain polioviruses were found, suggesting programmatic failure to find and deal with them much earlier. The targets of action are incredibly complex. Whether it is the urban density of Karachi with its huge population churn. Whether it is the extreme poverty, adverse environment and border town culture of Killa Abdullah. Whether it is the elusiveness of the mobile populations flowing within and between Afghanistan and Pakistan by day and by night. Whether it is the barrier to access in southern Afghanistan, the traditional home for 90% of the country's most stubborn polioviruses, which seems to rise and fall at random. Each of these contexts, and others, in the remaining poliovirus strongholds is resistant to the steady, methodical approach that has produced polio-free environments elsewhere.

In Pakistan, transmission of poliovirus has been interrupted at every site but never at the same time. Chaman in the Killa Abdullah district is an example of one of the most high-risk areas in all of Pakistan, yet the poliovirus is not being steamrollered into submission there.

The quality of microplanning and microcensuses is vital when there is such large-scale population movement. Area supervisors are the key personnel. They, and their counterparts at district and union council level, need, wherever possible, to be female and able to check on the fieldwork. They need to be highly competent, strong and assertive. Initiatives to give more women the confidence to take on these roles would be particularly valuable. The supervisor roles are amongst the highest paid in the Polio Programme, so the leadership needs to be hard-nosed in ensuring that the very best people occupy these roles.

The GPEI and the country authorities at national and provincial level cannot be comfortable about Pakistan in spite of a very low number of paralytic cases. The primary concern for Pakistan is that the poliovirus is still being found in many parts of the country in the environment. If we look only at the number of cases, there is a good situation. If we look at the distribution of cases, doubt and worry begins to creep in because each province has notified a case of polio this year. Then, when we look at environmental sampling, there is much more poliovirus and concern deepens.

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The Polio Programme in both Pakistan and Afghanistan is focusing on the very high-risk districts within their countries, the high-risk mobile populations that enter and leave key reservoir areas and the major population flows across the borders. The GPEI partners and the government teams have a very good understanding of both aspects. A great deal of work has been undertaken to describe the composition of the high-risk populations and in mapping their movements. Detailed assessment, profiling and small area analysis is allowing segmentation of districts so that intensive effort can be directed towards the most polio-vulnerable geographies. The biggest problem for the Polio Programme is not with the diagnostic side of things. It is with implementing solutions that have traction and sustainability. If there were peak programmatic performance of the kind consistently delivered by some Polio Programmes elsewhere in the region, then polio would already be melting away towards species extinction.

The IMB feels that the GPEI leadership should give more attention to the suboptimal and variable performance of local teams. Were this a concern about performance in one or two areas, it would be a management matter for the relevant Emergency Operations Centre or the Regional Office. It is now a systemic concern because it is clear that the GPEI does not have the capability to ensure peak programmatic performance in enough places to deal a decisive blow to the poliovirus. There are certainly problems of inaccessibility but equally there are failings in management ability to deliver to a high standard and crucially to sustain gains when they have been made.

The IMB has repeatedly commended the strong political engagement and leadership from all levels in Pakistan. It was surprised therefore to note that the speed of action has not always been there. For example, the Prime Minister immediately decided on a Twin City Task Force in response to the situation in Islamabad and Rawalpindi but it took some time to materialise, wasting nearly a month before something was working effectively. The issue of visa refusals and delays for key polio leaders, advisers, and managers should be regarded as a marker of cross-government political engagement. It should be resolved but such root causes of risk to the Programme should never be allowed to prevail.



NIGERIA, LAKE CHAD, AND SURROUNDING COUNTRIES

The shocking re-emergence of the poliovirus in Borno back in August 2016 generated a strong outbreak response last year. There has been no indication of continued poliovirus transmission since then. Without increased access to Borno for immunisation and surveillance activities, it cannot be said that transmission has stopped. The IMB is also deeply concerned about waning political commitment in Nigeria, at both Federal and State levels. The Presidential task force meets infrequently, and the upcoming elections in 2019 present a further risk. Public trust in the vaccination programme is critical. Rumours surrounding vaccine use with the emergence of the Monkeypox virus in Nigeria has generated hesitancy among some communities and will be a challenge to population acceptance of future vaccination campaigns.

No wild poliovirus or circulating vaccine-derived virus has been reported in Nigeria in 2017. The last wild poliovirus case had onset of 21st August 2016, about 15 months ago, in Borno state. The last wild poliovirus detection was from a healthy contact one month later on 27th September 2016, again in Borno. The last circulating vaccine-derived virus had its onset on 28th October 2016 in Sokoto State. There have been 11 vaccine-derived polioviruses reported in 2017, from environmental samples, in four states (seven of them from Sokoto) and one healthy child. There have been five polio compatible cases reported from four states in 2017, compared with 25 cases in 13 states in 2016.



Around 30-40% of settlements and an estimated 162,000-230,000 children in Borno remain trapped. This is a dangerously high number. Cross-border movement, internally displaced and refugee populations, continued insecurity and patchy immunisation campaign quality in Lake Chad Basin countries also pose a risk of continued wild poliovirus circulation. No discovered cases, even after a year, or more does not mean poliovirus is absent. In Borno, mainland areas, and the Nigerian islands in Lake Chad there will be inaccessible children unlikely to have received any response vaccine.

Unlocking Borno

It remains the key challenge to gain access to the remaining children that cannot be reached in Borno. In Nigeria, the polio priority has resulted in engagement with the security

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services. They have opened doors for the Polio Programme in the insecurity-affected areas of country. There has been important progress since the outbreak in August 2016. Over 250,000 children have been reached with the support of the security forces, the military and a civilian joint taskforce. However, there is a remaining large pool of children, over a wide geographic area that is still not being reached. The Polio Programme in Nigeria needs to move to another level of engagement, especially with the military in areas where populations are still trapped. Two years ago, the current administration in Nigeria pledged that no part of the country would be under Boko Haram territorial control. This commitment was made and is not yet accomplished. Politically, the movement will have to come from the President and Commander in Chief. He enables his ministers, but also the military, the governors and all the actors to



align around that. Unless there is a breakthrough to reach those areas in Borno, the entire Polio Programme is at risk. It must be a much more operational level of engagement in which the Programme is closely coordinating with the military, on a neutral and humanitarian basis, to identify those locations and populations that must be reached. Too much of the engagement, to date, has been opportunistic. It has been driven by what the military's imperatives are, what the military needs to do. In moving forward over the next six months, the military could assist in a decisive big breakthrough by allowing the shifting of the emphasis to the humanitarian ethos of the Polio Programme saying, *"We need to get to these locations, can you get us there?"*. This is what is desperately needed.

The starting point for considering polio in Nigeria is always the inaccessible population in the north-east of the country. For the people in Borno who have not yet been reached, it is not just a question of vaccination, it is also the absence of proper surveillance. Since a programme of immunisation cannot be mounted there, nor is there any meaningful surveillance activity, poliovirus circulation cannot be ruled out.

The wider political and economic environment

The IMB is also concerned about the political and economic environment in Nigeria. The presidential taskforce met once with the vice-president, but had not met for a very long time. It is not clear whether this is going to continue and ensure engagement of the country at all levels. The

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allocated funding from the Federal and State governments has not been released on time, in spite of the stated commitment of the government. All of the states, except Rivers State, have already gone over their current budgets, so are working in a deficit. A further factor with an impact on budgets is that Nigeria is due to transition out of Gavi support in 2020/2021. This is a major concern and has been discussed in Gavi circles. The approach will be a tailored strategy for Gavi engagement in Nigeria, given the risks involved. This will be developed over the next several months for presentation and approval to the Gavi board in June of 2018. It will be very important for the polio assets and polio capacities to be considered in this broader strategy.

The areas of improvement of performance in Nigeria since the last IMB report will not be sustained unless the country truly owns the Polio Programme. All the Abuja Commitments, the markers of political leadership and alignment that drove progress, in the second quarter of 2017 were below 50%. The federal financial contribution in 2017 for the Nigerian Programme from the government has not yet been fulfilled. There are indications that this will be reduced for 2018 by a further 60-75%. If it remains, it will indicate a real weakening of political commitment for the Nigerian Programme.

Losing public trust

There have been many other infectious disease outbreaks in Nigeria. In the last three months, there has been a very large cholera outbreak in Borno; close to 3000 cases were detected there and in some other localities. There has been a hepatitis



E outbreak as well as cases of Lassa Fever and Yellow Fever. The country has also been hit with an outbreak of Monkeypox virus that had led to 94 suspected cases across 11 states by the end of October 2017. All this is putting pressure on the public health system and health priority-setting mechanisms. The Monkeypox outbreak has set the country alight with rumours and negative attitudes towards government vaccine programmes. They started in a part of the country that is vaccine friendly. So, this is mistrust occurring in a solid region, where normally it would be possible to rely on the population having a positive attitude to the polio vaccine.



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It is very serious that public trust in the polio vaccine is in peril. For example, in Yobe State (this is the worst hit in the north) rumours have been really strong and 15 local government areas were affected. The polio campaign was delayed. The hesitancy by parents and communities across the country is in danger of becoming systemic.

Strengthening routine immunisation

In responding to the concerns of the GPEI leadership, donors and wider partners about the budgetary reductions, the Minister of Health of Nigeria stated that the country had also doubled its allocation to routine immunisation. He saw this, not as diminishing support for polio, but as building for the long-term. The allocation in the proposed budget in 2018 for routine immunisation will be the highest in the history of the country.

The last national immunisation survey showed 33% routine immunisation coverage throughout the country, with figures as low as 3% in states like Sokoto. Most of the states in the north hovered around 20%. This shows that the Programme is operating on a very weak, very fragile infrastructure, shored up by campaigns, to boost immunity with oral polio vaccine. All of the other antigens are, in places, at a shockingly low level. There are huge risks and a fragile underpinning to this Programme overall. There is a National Emergency Routine Immunisation Committee where the goal is to reach 85% coverage by 2025. That requires not just political will. It needs financing and real priority setting to establish the foundations to sustain what has been achieved

in Nigeria. The country has some of the highest numbers of unvaccinated children in the world.

The government will put more money into routine immunisation, but will internally address the imbalance in the allocation to polio. The Minister felt strongly that inefficiency in campaigns is huge; about 50% of the budget goes on travel, advocacy, mobilisation, and yet it still does not reach enough people. In parallel, the Government of Nigeria is starting to implement the basic health care provision and by January 2018 will do so in three states intending to reach eight million Nigerians with basic health care. Immunisation will be a key component of this.

The Minister's vision is that people will have confidence, and as he put it, they will say, *"Look, this is not just a polio programme, it is a health and wellbeing programme"*. However, the Government of Nigeria must be wary of the timelines. It is likely to take a decade or more for those routine immunisation systems, compared to where they are now, to be at a level where they would make major contributions to polio eradication. The Polio Programme does not have the time to see those systems catch up. That does not obviate the importance of improving the unacceptably low level of routine immunisation in Nigeria.

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Continuing doubts about surveillance quality and blind spots

When looking at the areas surrounding Nigeria, it is important to remember the shock that was felt when it became clear that Nigeria was not polio free but had been harbouring a hidden circulating poliovirus that been spreading for five years. The Polio Programme really has to internalise the lesson of that. It is entirely possible that the same situation is happening in the Lake Chad region, or elsewhere in Africa. It is vital that at the highest levels in Chad, the Central African Republic and Niger, there is engagement to make clear that there are big blind spots in each of these countries. In the Lake Chad region, the Polio Programme operates differently. For all the countries that are bordering Lake Chad, their Polio Programmes are so different to Nigeria's that it is like "chalk and cheese". The pace of implementation is much slower. There is nothing like the same level either of management oversight or technical assistance. A very different level of response is essential in securing access to susceptible populations and in driving programme performance. High-level advocacy visits to countries in the Lake Chad area and bordering with Nigeria by GPEI partners must continue to ensure that they maintain the vigilance required. The IMB understands that the Lake Chad Task Team coordination will be extended beyond December 2017 to June 2018.

The GPEI, in a strategic overview of this region, should undertake a careful assessment of where there are blind spots and where there may be poliovirus hiding.



Nigeria: Key observations

The tone of the IMB's discussions with and about Nigeria struck a very sombre note. Even thinking beyond the inaccessible population in the north, as the only one of the three endemic countries with no reported cases of wild poliovirus in 2017, it might have been expected that Nigeria would be striding forward, like India had, to secure its certification status. The IMB is deeply concerned about the national situation in Nigeria. The risk is much wider, even though the poliovirus is localised in a particular geographic area. There is little appreciation for this heightened risk because the dominant narrative is just about Borno.

The IMB detected a broad range of strategic factors in the Nigeria Polio Programme that suggest that the country is potentially still vulnerable to polio. These have been



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discussed in more depth earlier in the report but, taken together, could mean that if there was another poliovirus outbreak, it would unravel very quickly. This would be bad for Nigeria itself but also for surrounding countries.

First, there have been many other infectious disease outbreaks in Nigeria. This is putting pressure on the public health system and priority setting mechanisms. Second, there are low levels, and in some parts of Nigeria very low levels, of routine immunisation. Third, there are concerns about the funding flowing through into the Programme internally, and then, externally, the IMB noted that Nigeria will be graduating from Gavi funding in 2020/21. Fourth, as noted in the last IMB report, there are serious concerns about the quality and truthfulness of some of the data coming through, and fears that these have not yet been completely resolved. It is essential to be able to rely on surveillance and campaign quality data. Fifth, there are the Monkeypox rumours eroding trust in polio vaccine and routine immunisation. Sixth, there are accounts of fatigue and some degree of complacency in the places that have not seen any poliovirus for a long time. Finally, the quality of the political alignment that was there a couple of years ago, as the country started to move towards interrupting transmission, looks weaker than it has in the past.

Something really transformative needs to happen. Continuing with business as usual is just too risky. The Abuja Commitments were very influential on the polio side, but something that galvanises top level political engagement is now needed that links getting to the finish line on polio as well as doing something for the longer term to improve routine immunisation. Without rapidly improved coverage, Nigeria could be heading for a very unpleasant surprise. Nigeria's leadership at the very top must recognise this risk to avert it.

OUTBREAKS OF VACCINE DERIVED POLIOVIRUS

The number a vaccine-derived polio cases so far in 2017 is 16 times higher than in 2016. There are currently two serious outbreaks outside the polio endemic countries.

Losing control in the Democratic Republic of Congo

The Democratic Republic of Congo has experienced two separate outbreaks of vaccine-derived poliovirus type 2 in three of its provinces: Maniema, Tanganyika and Haut-Lomami. There have been 10 cases in total.

The pattern of poliovirus distribution and linkages of cases equates to ongoing transmission. This outbreak is out of hand.

The initial immunisation rounds mounted in response to the outbreak were of variable and poor quality.

The country faces major challenges. Surveillance systems in the Democratic Republic of Congo are weak. The genetic sequencing results of the polioviruses, particularly from Haut-Lomami, show that they were circulating there for quite a long period of time before they were actually detected. This further emphasises the gaps in surveillance. Environmental surveillance was started in October 2017 in three provinces (Kinshasa, Maniema and Haut-Katanga). Other surveillance measures are being enhanced or introduced. There is geographical inaccessibility because of areas of very difficult terrain that the vaccination teams could not reach. Some villages were not recorded on the maps of health zones for vaccination. The authorities

have used Google Maps to geomap all villages to identify the ones that were forgotten and not included. Now, in preparation for another immunisation round, they are including those villages in the microplanning.

A number of communities within the Democratic Republic of Congo are still resistant to vaccination, and refusing to let their children receive it. A new communication strategy is being developed. It will target these resistant groups, ensuring the involvement of the local leadership, including religious leaders. In addition, a house-to-house communication campaign has been mounted. Most importantly, there is a plan to supplement the existing data next year with qualitative surveys to be able to better understand the views of communities towards vaccinations in general and polio in particular.



OUTBREAKS OF VACCINE DERIVED POLIOVIRUS



In a number of villages, population immunity is very low because of poor vaccine coverage. Priority is now being given to strengthening routine immunisation building on Gavi funded programmes. Of the 28 affected or at high-risk health zones, only 18 are covered under Gavi funding. This has left the remaining 10 health zones (that are not part of Gavi) needing approximately \$1.5 million.

It is also deeply frustrating to see delays in essential fund transfers. There has been a change in the process of approval of funding, with new bureaucracy in place. There should be no wallowing in bureaucracy when lives are at stake. The leadership of the United Nations Children's Fund (UNICEF) and WHO have undertaken high-level advocacy with the Ministry of Health to really push for the timely settlement of cash transfers. This appears to have helped but it should not have been necessary.

The IMB is concerned that the Government of the Democratic Republic of the Congo has not put a high priority on the response to the outbreak of vaccine-derived poliovirus. There have been a number of activities and supporting efforts, but, under the International Health Regulations, since this is an outbreak of vaccine-derived poliovirus type 2, the government is supposed to declare a national public health emergency. It has not done that.

The government has appeared to take the position that, *"We're treating it as an emergency internally, but we're not going to make any statements for political and communication reasons"*. At the same time, the government was fighting an outbreak of Ebola in the north of the country. That certainly complicated the situation. The IMB does not believe that the government has taken the appropriate action at the political level and then mobilised the administrative and financial flows necessary to mount an effective response.

In some ways, the outbreak in the Democratic Republic of the Congo could be seen as the shape of things to come. From previous history, the country was a hotbed for vaccine-derived poliovirus development. The country was hit by the outbreak because of the context of declining type 2 poliovirus immunity and also very low population immunity because of the underperformance of the routine immunisation programme.

OUTBREAKS OF VACCINE DERIVED POLIOVIRUS

The exceptional complexity of Syria

In Syria, so far 70 children have been paralysed with vaccine-derived poliovirus type 2 since March 2017. Mostly the outbreak has centred in the area of the Deir ez-Zor Governorate and the districts of Mayadin in that Governorate. This is an area that was under the control of the so-called "Islamic State". It is the area of very active conflict and fighting.

Vaccination has been put in place to respond to this outbreak. There have been two rounds of vaccination in Deir ez-Zor (in the eastern part of the country) and two rounds in Raqqa (in the northern part of the country). There is a very long lag time between collection of samples

from acute flaccid paralysis (AFP) cases and their arrival at the laboratory for testing. Therefore, it is possible that more cases will be detected, even after the two rounds. So, contingency plans are in place to be able to do more vaccination.

Also, it appears that all cases so far have been close to the epicentre of the outbreak. Should surveillance show circulation beyond Syria's border, to areas of low immunity, this would be a very serious development. The current strategy for the breadth of population coverage with monovalent oral polio vaccine should continue to be reviewed at the highest level in the GPEI, with a view to the next round going much broader.



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SOCIAL DATA: A BREAKTHROUGH TOOL

Reaching the most difficult, marginalised and mobile populations remains a pivotal challenge. In order to do so, a rigorous understanding of behaviours, opinions and cultures that could act as barriers to immunisation is needed. At this stage of the eradication process, there are seemingly intractable problems in communities. Social data could be a driving force in producing a much-needed breakthrough, especially in communities where trust in government programmes is low.

In the Polio Programme, social data have historically focused on tracking campaign awareness, sources of information and addressing refusals. Later, this has evolved into understanding why children are missed, how frontline workers can be more effective and how trust can be built within the community. The social data focus is continuously evolving to be responsive to risks such as campaign fatigue and rumours that fuel refusals. In retrieving social data, it has been important to gain in-depth knowledge about what happens at the doorstep or vaccination site, as well as understanding supply issues or unmet expectations.

The wealth of social data collected is impressive and it has produced useful insights. There has been an enormous improvement in the acquisition and use of social data and its integration into the Polio Programme. There have been 12 KAP surveys conducted in seven countries over the past five years. In the endemic countries, KAP surveys are conducted repeatedly to track changes in perceptions

and major social indicators. Since a heavier focus has been placed on perceptions of frontline workers, trust has increased to around 75% in Afghanistan and Pakistan. However, campaign fatigue, reflected by respondents' perceptions that a vaccinator visits "too many times" has increased two-fold in Pakistan. A focused communications message hailing women as the "guardians of health" resulted in a 24% increase in vaccinator trust in Balochistan.

The KAP surveys, though useful for following trends in perception and knowledge, are not sufficient to gain a full understanding of complex and poorly understood behaviours such as migratory patterns and guest children (those in high-risk mobile populations). Generating qualitative research that focuses more on social norms, network analyses and socio-economic assessments will assist in the understanding of such phenomena. It will also help determine whether children who are away are refusals "in disguise" or that the children are genuinely away from home.

Gaps identified in the social data include: understanding the barriers and facilitators to continued repeated immunisation; what the risks may be in the transition period; barriers to recruiting female team members; and the complexity of the context in which eradication needs to take place, such as working in conflict zones. In areas where access is short-lived, immunisation campaigns need to be rapid. Social data should support these incursions as much as possible using rapid collection methods.

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To improve the use of social data and thus campaign quality, it is essential to proactively integrate social data into programme planning. The use of a social and behaviour change model to support programme management should not be linear but rather dynamic and interactional in nature. Organisations working on the frontline could be helpful allies in this process by assisting in data collection, analysis and developing local solutions. In addition, the role of social media represents fertile ground for exploring ways to counter rumours or hesitancy in real-time. Communications must become a stronger and integrated part of outbreak assessments, and the people with the right skills, languages and experience should be deployed to deal with outbreaks more effectively than in the past.

SURVEILLANCE

The GPEI report on surveillance, produced by US Centers for Disease Control and Prevention (CDC Atlanta), in response to the IMB's recommendation in its last report, is an excellent piece of work. It shows there is a great deal more data coming in than there is data being thoughtfully analysed. The IMB is deeply concerned about issue of so-called 'masking'. In other words, as vaccination is increased, including with inactivated polio vaccine (IPV), the ratio of cases to infections may be increasing. The number of cases is already decreasingly representative of the scale of transmission. It may be harder to track where the virus is. Cases will become less reflective of the epidemiology. The Polio Programme must not become lulled into a false sense of security by a decrease in case numbers. Each



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case is likely to represent a thousand, or thousands, of infections that are not being seen, and this ratio may be increasing; these are bigger numbers than 'textbook' polio epidemiology would say. In other words, there is the possibility that a stable or decreasing number of cases may mask an increasing number of infections. There must be a plan to anticipate this possibility.

There was extensive discussion at the IMB meeting about other ways of trying to search for the virus. For example, the Nigeria Programme has undertaken environmental sweeps but these seem to be of limited value in detecting poliovirus. The likelihood of identifying anything is so small that a negative result is really no result. It does not mean that there is no virus in a community since there is a low likelihood of detection. It is to be hoped that this



method does not become a mainstream surveillance tool in the Polio Programme. Rapid expansion of continuous environmental sites, which would allow for serial collections, and therefore be more measurable over time, would potentially be a better alternative. More also needs to be built into the interpretation of the results of environmental sampling based on studies of the sensitivity of the method that seems to vary greatly across sites.

In one community in Pakistan, it was reported that there were four healthy children identified with viral shedding. It is not clear what the importance of such a finding would be in polio surveillance and what are its limitations. In effect, in the context of widespread environmental positives, this is sampling the 'environment' in children's guts. It is not clear that sampling the stool of healthy children is likely to be productive. Environmental sampling involves collecting stool from tens of thousands of individuals, and poliovirus can persist in the environment for many months. Therefore, to approximate environmental surveillance, tens of thousands of children would have to provide stool samples for months on end. This does not seem like a feasible or productive approach.

On a number of occasions, during IMB discussions, the country teams pointed to the results of serosurveys, stating or implying that this direct measure of a child's immunity was somehow a 'gold standard' or the 'purest' measure of the Polio Programme's performance. Ministerial teams were enthusing about serosurvey findings. The IMB was concerned that the technical teams were not making clear

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to the political leadership in the countries that there are many limitations of serosurveys. Essentially, the strength or weakness of such surveys depends on which populations can be accessed. For example, in some surveys, blood is being taken from hospitalised children. These are obviously children who are seeking care. So, even with rigorous, truly standardised testing methods, the very children who are not getting vaccinated are most likely to be missed. Some of the results of serosurveys of immunity are encouraging but if a child can be reached for a serosurvey, they are also likely to be reached for vaccination. So, whilst the serosurvey data are interesting they must not be interpreted over-confidently, and they may provide a false sense of security.

Thus, there is a range of issues that point to the need for more work at global level to: clarify the validity of different

surveillance measures; establish what has been learned from the use of surveillance methods in successful parts of the Programme; evaluate potential new approaches; and give simple guidance to Emergency Operations Centres and field teams on which tools to use and how to interpret the results that are produced. In the meantime, much more emphasis should be given to analysis and verification of the standard indicators of reported AFP rates and stool adequacy, and to closing the gaps in these areas as well as identifying patterns of reporting which are likely to represent data falsification.

The concern expressed in the last IMB report about the truthfulness and reliability of surveillance data in Nigeria is not completely dispelled. Examining patterns of data that suggest surveillance data are not accurate must become a routine part of the Polio Programme.



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Now that the number of polio cases is so low, there is also an important question about the scope and nature of investigations. Currently AFP cases are subject to very extensive investigations. They result in reports that are 30 pages long. The reader gets a very striking impression akin to the kind of factors that are revealed in the investigation of an 'accident' in other sectors. The fundamental things that went wrong, that should not have happened, are listed. The system failures are identified. To all intents and purposes, you could be reading about an avoidable death in a hospital after surgery or a derailed train. In this sense a polio case is the 'accident'. It should not have happened. It happened because of weaknesses in the system and failures of processes designed to protect the child. The analyses in the 30 page reports show that up. The reports are studied at a local level but it is not clear what aggregated learning is being drawn from individual reports to a global and systemic level.

Up until now, the Polio Programme has handled the investigation of AFP cases and environmental surveillance isolates differently. The argument is that with environmental surveillance isolates there is no case. So, there is nobody to visit and there is nobody to talk to. Perhaps this thinking needs to change. An aggressive, area-focused evaluation triggered by an environmental isolate could be very insightful.

The GPEI may wish to think a little more about how to formalise the environmental surveillance isolate investigations. What is going on in that population?



What is the Programme doing in that community and where are the gaps?

This could help in a difficult geography like Killa Abdullah or Karachi where viruses keep getting isolated. The Polio Programme clearly has a big problem but could benefit from a more formal way of characterising them.

The airline industry does not make airlines even safer by investigating air crashes because they hardly ever happen. What they do is analyse in-depth things that *could* have led to a crash but did not – near misses. That way they are focussing 'upstream' on avoidable factors. In health care, the concept of *Never Events* has been a helpful focus for investigation. *Polio Never Event and near-miss* lists could serve a similar function.

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Another key issue for the Polio Programme is to have a way to identify blind spots where silent poliovirus circulation may be occurring. Extensive work by CDC Atlanta, at the request of the IMB, has concluded that blind spots can only safely be identified at the provincial level in the African continent. Blind spots in surveillance fall into two categories: known and unknown. Known blind spots include all provinces failing to meet the composite index of surveillance (definitions are in the data insights section of this report) for the past 24 months. This does not present the entire picture. A province meeting the composite index may include unknown or unrecognised blind spots, where data quality is suspect.

Where should the Polio Programme hunt for blind spots? CDC Atlanta has produced two blind spot matrices (maps displaying them are in the data insights section of this report). One is a matrix of virus transmission against surveillance performance for each geographical area and the other is a matrix of surveillance performance against areas of conflict. For both matrices, 'red' (the worst) areas should be the highest priority, as they represent known blind spots in areas of conflict or virus transmission.

CAMPAIGN STRATEGY: FREQUENCY, QUALITY AND GEOGRAPHICAL SCOPE

The IMB is concerned that the implications of the duration of poliovirus transmission have not been given sufficient strategic thought. There is evidence of some ongoing transmission for a relatively long period of time, with not necessarily any decrease in the genetic diversity over the

past year. This points to possible "ping-ponging" of cases between different places. The fact that nine long-chain viruses have been found in Pakistan and Afghanistan in 2017 is not what would be expected for a programme aiming to stop transmission in the near future. Missed populations and the possibility of masking with IPV, makes this more difficult to identify. This duration of transmission issue, throws up the question of the frequency of immunisation campaigns.

This subject has been debated over several years. If campaigns are carried out often, can the quality be increased enough by the next time the teams go into



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the field? Is their next campaign based on a considered improvement plan? However, if campaigns are carried out less often, and the quality is not increased, this is a disaster. It is said that in some other countries, towards this stage of the eradication effort, the pressure to succeed was so great that no space was created to improve quality.

The Afghanistan Polio Programme has extensive experience of dealing with access to communities opening and closing with rapid frequency. Paradoxically, it has a very good record in getting surveillance data even when opportunities for vaccination are very limited or even impossible. The IMB wonders what considered learning has been drawn out of experience and practice in these areas that open and close. What lessons are learned about how best to go in safely but optimise the time, while there is access, to achieve effective vaccine coverage? In a spirit of improvement, how has this learning been used to systematically improve campaign quality?

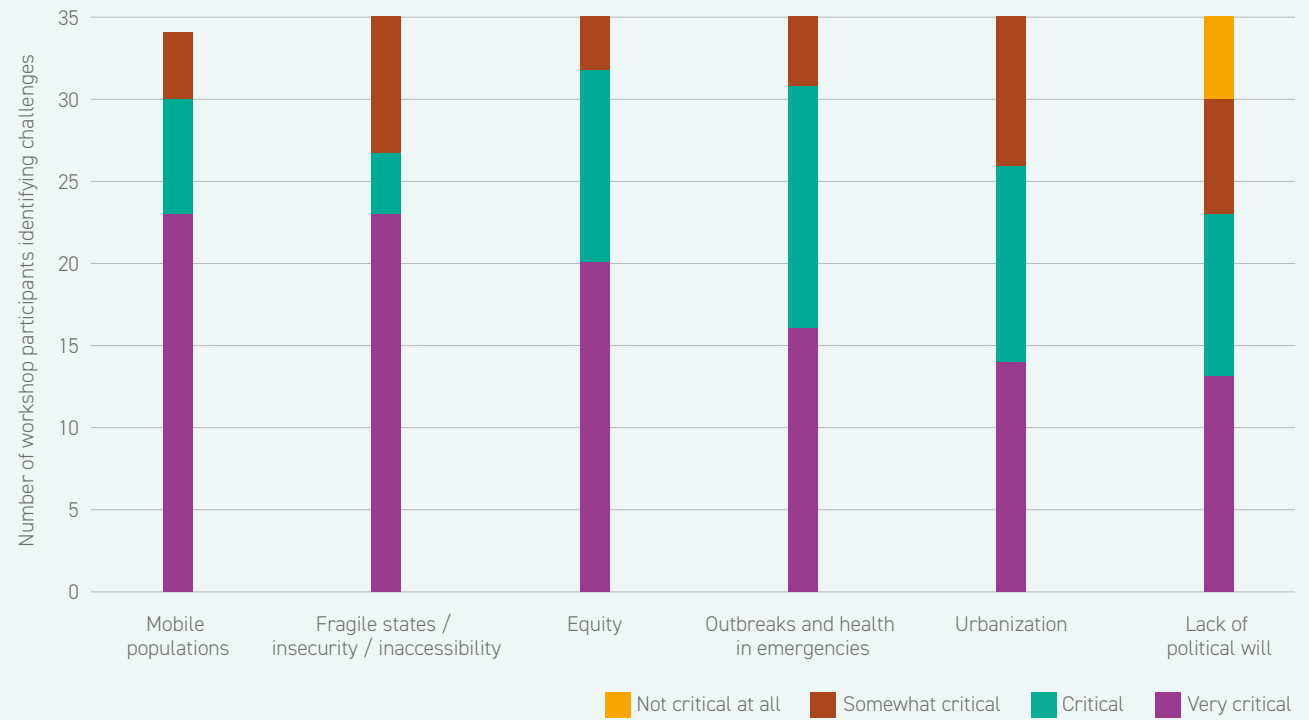
A major risk for the eradication is complacency, something for which there is no metric that can be monitored. Complacency can vary from campaign to campaign, from week to week depending on the local situation. That is one of the biggest challenges for the Polio Programme and can only be resolved by hands-on leadership.

WHAT ENDING TRANSMISSION MEANS

Tensions emerged at the IMB meeting between the GPEI leadership, with some believing the primary goal is the eradication of wild poliovirus, and not all polioviruses. In contrast, others challenged this interpretation, pointing to the increasing numbers of vaccine-derived poliovirus cases, transmitting from person-to-person and causing paralysis. As the potential for interruption of transmission of the wild polio virus draws closer, there remains a profound issue for the Polio Programme to grapple with. What is meant by eradication? If it is limited to just wild poliovirus, and not the vaccine-derived poliovirus, there will be challenges of communication and the management of expectation. The Polio Programme will be projecting an image of success, but it is highly likely, if not inevitable that vaccine-derived outbreaks will persist and that children will continue to be paralysed by the poliovirus, even after the final wild virus case has occurred. Some people may believe that they have invested in the eradication of all polioviruses, forever. It appears that the GPEI has made up its mind that the immediate goal will be met if only wild poliovirus transmission is achieved. It is important that the governance bodies of the Polio Partners are clear about this distinction.

DATA INSIGHTS

Mobile populations are a systemic challenge to success in immunisation (including polio) programmes across a range of countries

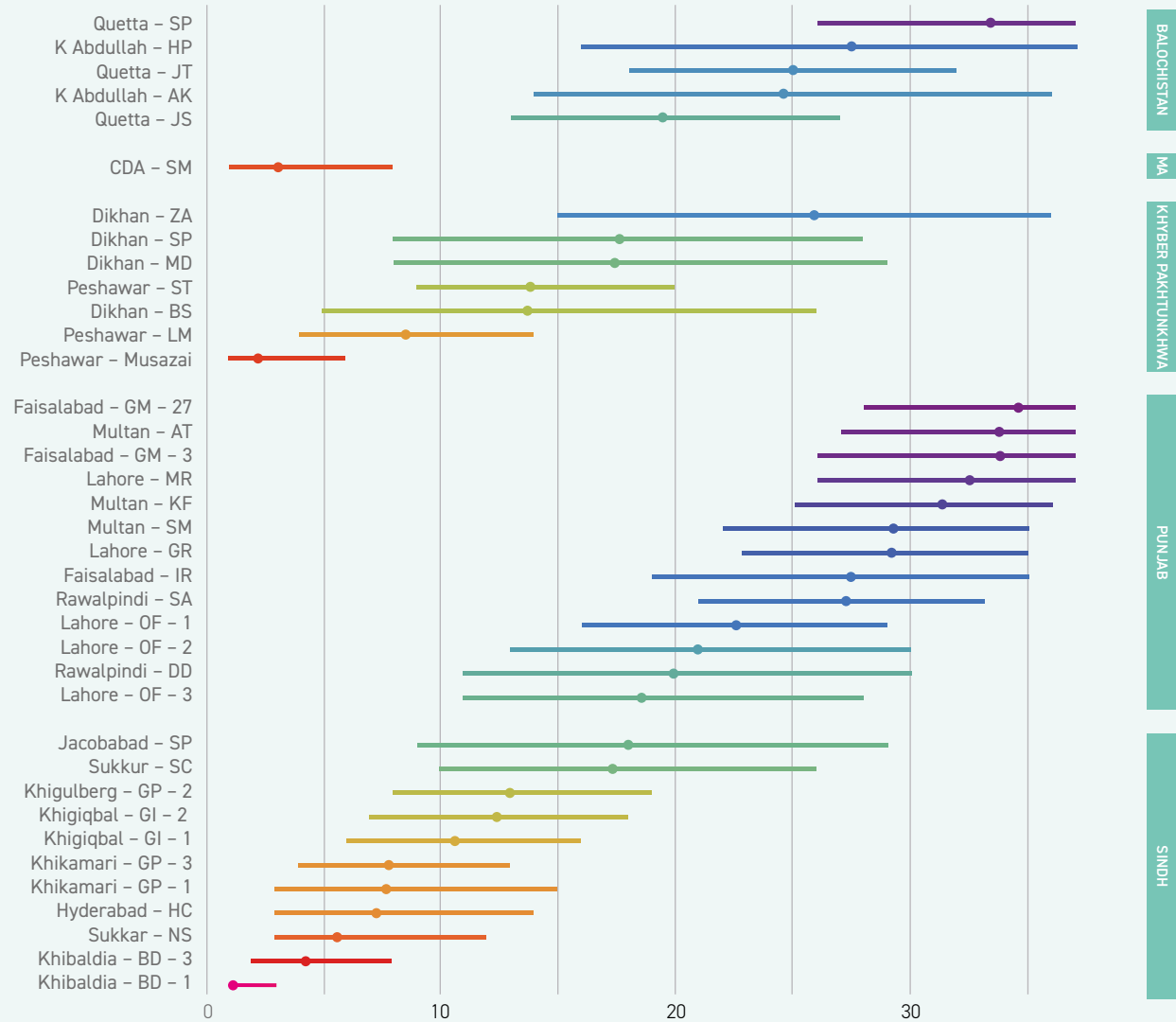


Source: Putting People First: Social and behavioural insights to reach the 5th child. New York: Unicef 2017

DATA INSIGHTS



Variation in sensitivity of environmental sites in detecting poliovirus: Pakistan



Composite ranking across Sabin types (worst -> best)

Composite index: ratio between the rate of observation of all Sabin viruses in environmental surveillance and the measured prevalence of these viruses in AFP surveillance for the district where the environmental surveillance site is located.

Source: Institute for Disease Modeling, 2017
Reference: S. Kroiss et al. Modeling of environmental surveillance sensitivity in Pakistan (not yet published)

DATA INSIGHTS



DATA INSIGHTS

Nine long chain viruses found in Pakistan and Afghanistan during 2017: A disappointment at this stage in the eradication process

Source	Country	Province/District	Date of Onset or Collection	Cluster	Closest Match %Identity/Location	Closest Match Source/Date
AFP	PAK	Punjab/Lodharan	28-Jan-17	R4B1C2	97.46%/Lahore(Punjab)	ENV/Oct2015
AFP	PAK	KP/LakkiMarwat	21-Aug-17	R4B5C1	98.67%/Multan(Punjab)*	ENV/Dec2016
AFP	AFG	Helmand/Nawzad	21-May-17	R4B5C4	98.34%/Pishin(Balochistan)	ENV/Jan2017
AFP	AFG	Nangarhar/Batikat	15-Sep-17	R4B5C5B	98.78%/Peshawar(KP)*	ENV/Jun2017
ENV	PAK	Sindh/KarachiGulshan	03-Feb-17	R4B5C4	98.23%/Sujawal(Sindh)	AFP/Sep2016
ENV	PAK	Balochistan/Pishin	02-Jan-17	R4B5C4	98.23%/Quetta(Balochistan)	ENV/Dec2016
ENV	PAK	KP/Peshawar	10-Jun-17	R4B5C5B	98.00%/Jalalabad(Nangarhar)	ENV/Mar2017
ENV	AFG	Nangarhar/Jalalabad	21-Jun-17	R4B5C5B	98.34%/Jalalabad(Nangarhar)	ENV/Jan2017
ENV	AFG	Nangarhar/Jalalabad	24-Jan-17	R4B5C5B	97.79%/Khyber(FATA)	AFP/Feb2015

*Orphan viruses with percent identity slightly above threshold value ($\leq 98.5\%$)

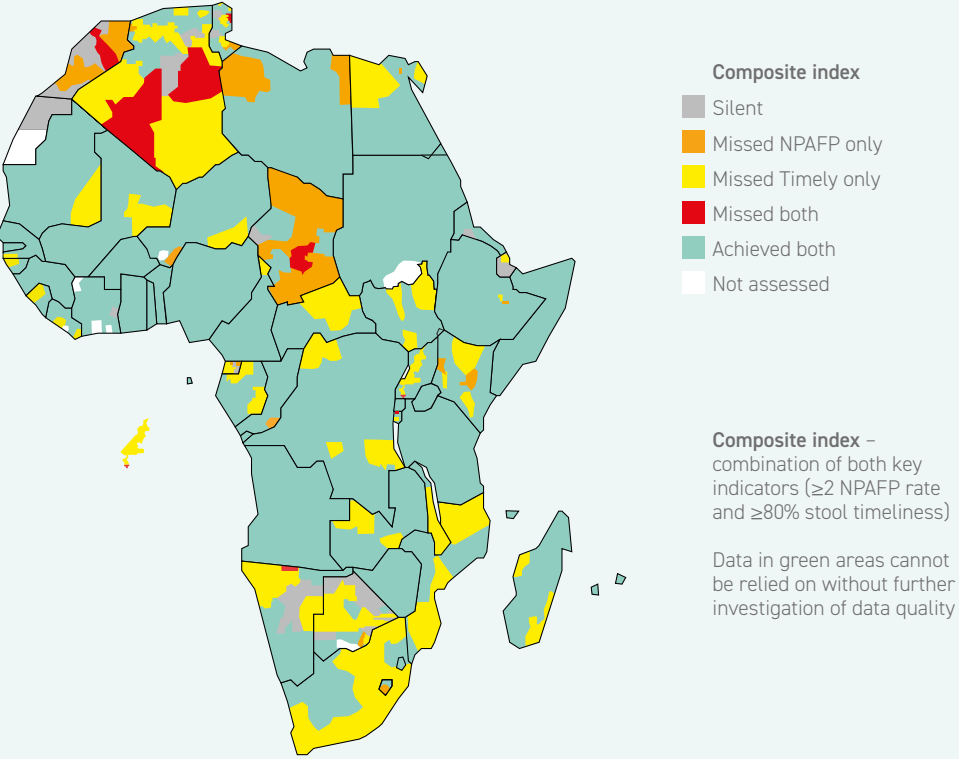
Source: CDC Atlanta



DATA INSIGHTS



Known polio blind spots: Provinces meeting and failing required surveillance standard

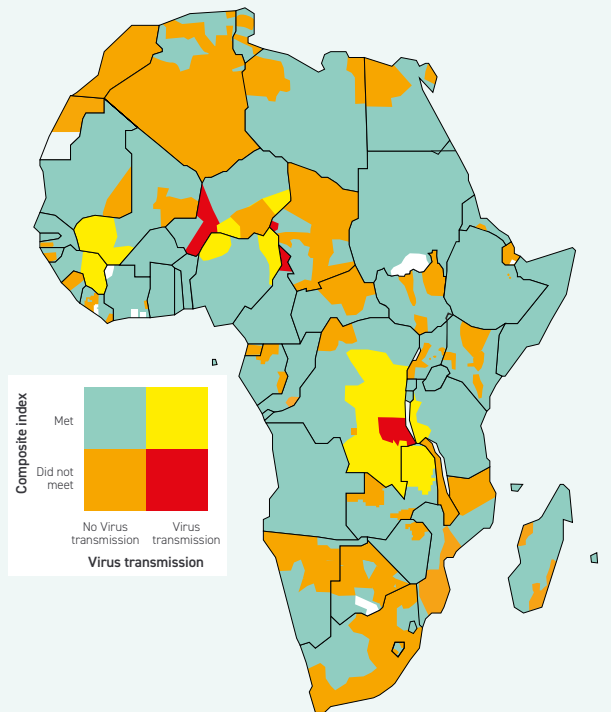


Source: CDC Atlanta; data cover period October 2015 to October 2017

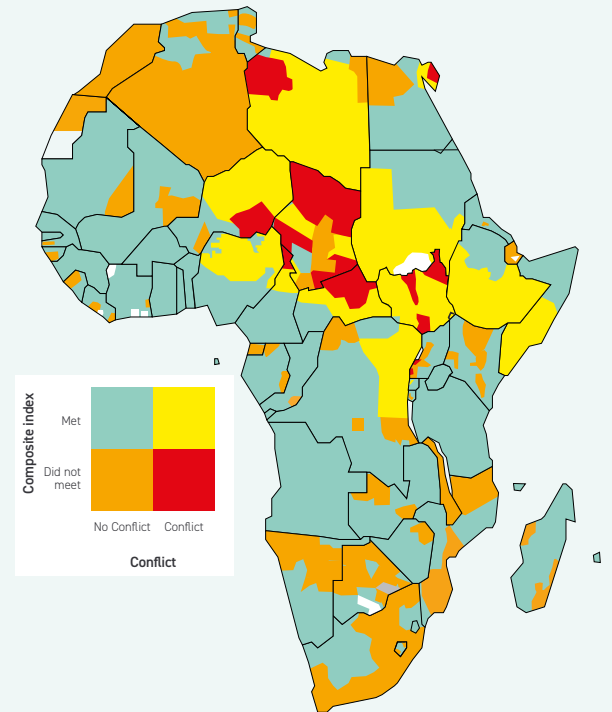
DATA INSIGHTS

Hunting for polio blind spots: Provinces meeting or failing surveillance standard according to poliovirus transmission and conflict history

Poliovirus transmission



Conflict



Poliovirus transmission: provinces (first administrative level) with or bordering a province with reported wild poliovirus or circulating VDPV

Composite index: combination of both key indicators (≥ 2 NPAFP rate and $\geq 80\%$ stool timeliness)

Data in green: areas cannot be relied on without further investigation of data quality

Conflict Areas: From Uppsala Conflict Data at <http://ucdp.uu.se/>. Areas of conflict defined as provinces with at least a single state-based, non-state or one-sided violent event that resulted in >50 deaths, 2015-2017

Source: CDC Atlanta; data cover period October 2015 to October 2017



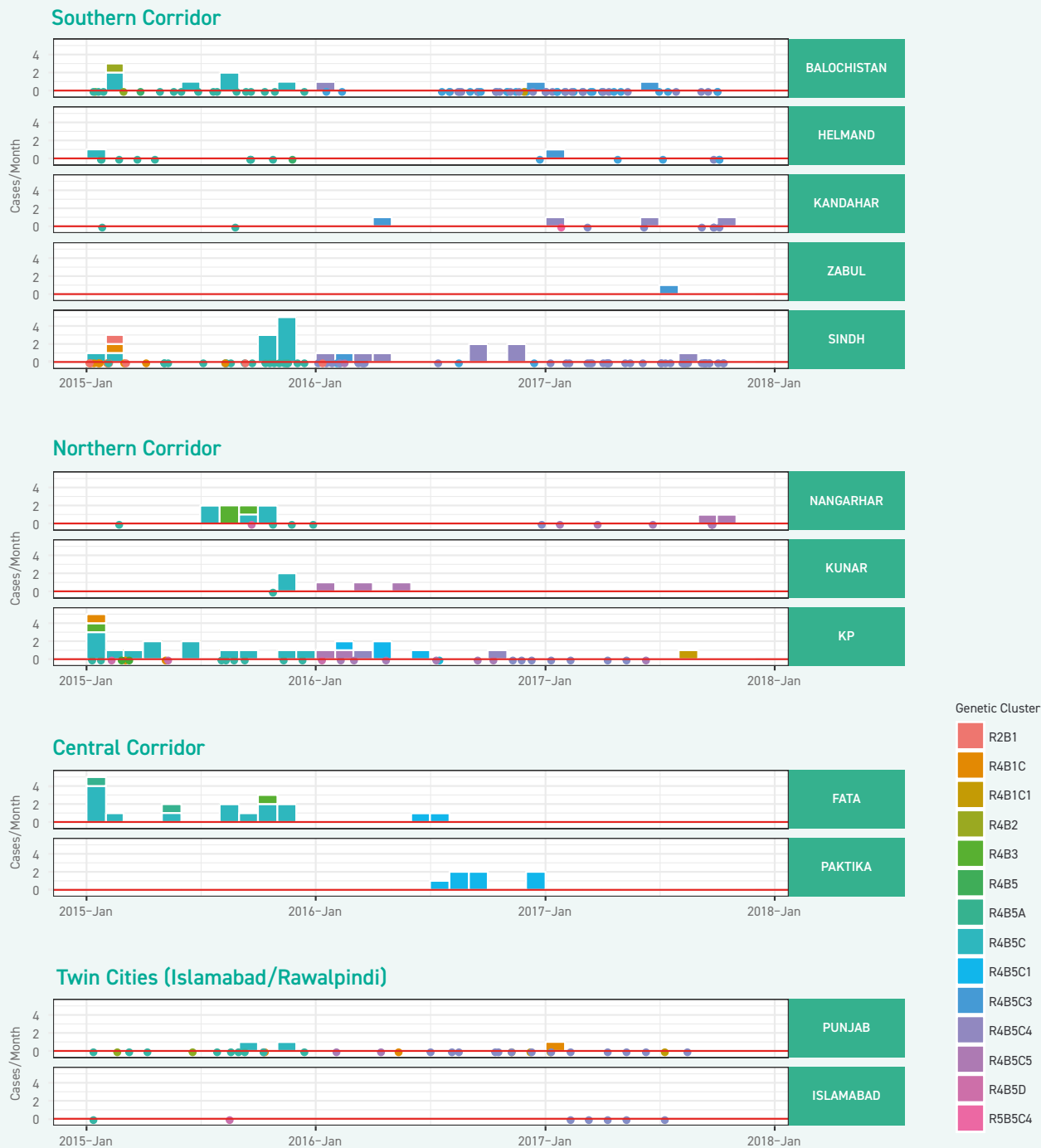
Poliovirus transmission in the two countries will not be interrupted unless all reservoirs are stopped simultaneously



Bars above the line represent WPV1 cases; circles below represent only the presence of positive environmental specimens, not the full number of positives.

Source: CDC Atlanta

The poliovirus has no nationality: The imperative to target common reservoir corridors

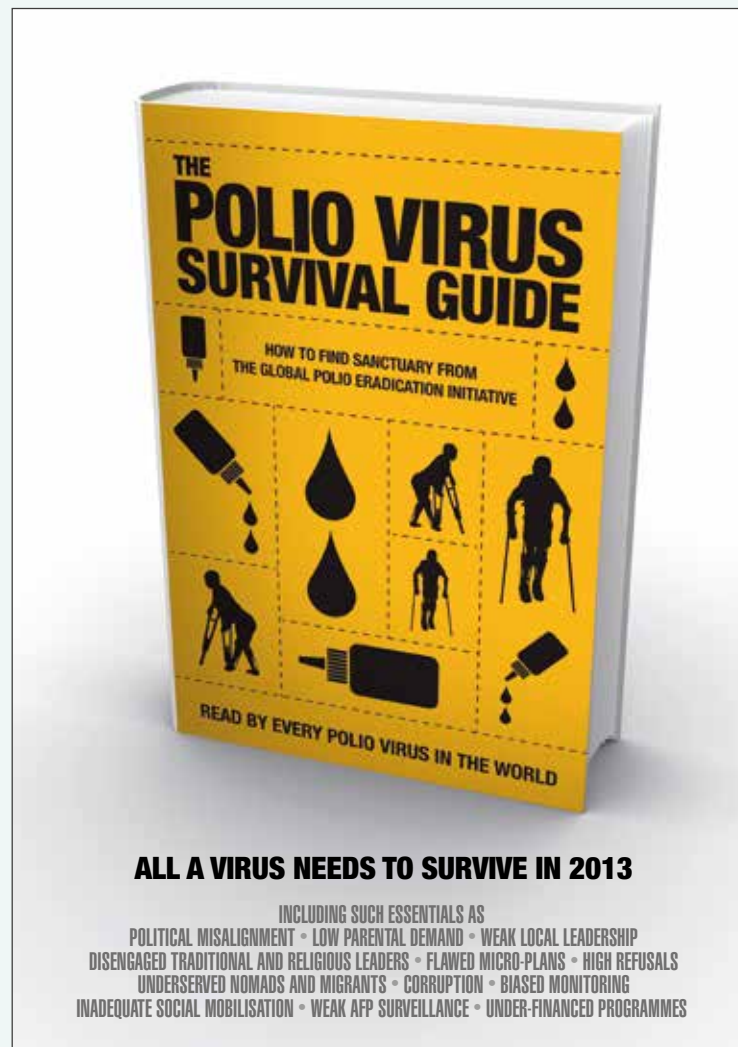


Bars above the line represent WPV1 cases; circles below represent only the presence of positive environmental specimens, not the full number of positives.

Source: CDC Atlanta

DATA INSIGHTS

THINK LIKE A POLIO VIRUS TO DEFEAT IT



Source: *Polio's last stand?* Sixth Report of the Independent Monitoring Board of the Global Polio Eradication Initiative. London: 2012.



CONCLUSIONS AND RECOMMEN- DATIONS



The GPEI is regularly communicating that the number of wild poliovirus cases is the lowest in history. This is an important marker of progress, and good for maintaining commitment, but it is not a reliable indication of when, or even how, transmission will be interrupted. A WHO spokesperson told the BBC in May 2016, *“This is the lowest toll of cases in history. We expect to be within months of polio elimination in Pakistan”*. This “almost there” narrative is perhaps not the best one to promulgate. Now that interruption of transmission has not materialised 18 months after this announcement, attention must turn to the number, distribution and geographical movement of polioviruses, not simply cases. This means much closer scrutiny of environmental samples and ensuring that the time-tested standard polio surveillance activities are delivered to a very high standard. This applies to Pakistan and Afghanistan where wild poliovirus is still actively circulating, and northern Nigeria as well as surrounding areas where there is still a possibility of it circulating undetected. The level of political commitment to polio eradication in Pakistan and Afghanistan remains high. In Nigeria, political commitment at the highest governmental level seems to have waned. Across the three countries, there are genuine and serious security situations that are barriers to progress. There have been improvements in programmatic performance since the last IMB meeting but some of the areas of weakness are getting better only

slowly. Where transformative change is needed to deal with unyielding problems it is not happening. There is still not enough evidence of organised, quality improvement programmes in areas such as microplanning, campaign effectiveness and highly mobile populations. An ethos of quality improvement has been shown to have a high impact in many other fields. Some observers have remarked that the Polio Programme has run out of ideas and is at risk of coming to a stalemate in its battle with the poliovirus. Many have remarked to the IMB that a pervasive sense of fatigue and low spirit seems to be permeating the GPEI. A small number of leaders reflected privately on whether eradication is even possible and whether, even if it does seem to have been achieved, the Polio Programme will know that it has been done. This is a concern. The IMB firmly believes that polio eradication can and will be achieved and calls on the leadership to re-energise the Polio Programme and inspire their staff to complete it.



CONCLUSIONS AND RECOMMEN- DATIONS



RECOMMENDATIONS

Global and Systemic

1. The GPEI leadership should continue to evaluate poliovirus surveillance methods and tools and issue guidance to ensure that the Polio Programme understands the strengths and limitations of each surveillance measure. This guidance should begin with strengthening the analysis and verification of AFP case surveillance and stool collection adequacy, as well as standardisation and continued expansion of continuous environmental surveillance sites. As part of this work, a formal *quality improvement plan* should be developed for poliovirus surveillance. Addressing this recommendation will not only benefit the task of ending poliovirus transmission but also greatly enhance the process pre- and post-certification of polio eradication.
2. The GPEI leadership should engage urgently with the CDC Atlanta methodology produced for the IMB to identify poliovirus blind spots. The further work on this, *inter alia*, should draw on analysis, learning and lessons from: Israel; Egypt; Borno, Nigeria; and Bannu, Pakistan. The discovery of poliovirus in these places appeared to be a complete surprise. In due course, the GPEI should develop an active plan, working with countries, to respond to the different types of blind spots.
3. The GPEI leadership should develop the concept of *Polio Never Events* (including polio cases, zero dose children and positive environmental samples). A very rigorous and full investigation methodology (with global and independent involvement) should be designed. It would be triggered by the occurrence of a *Polio Never Event* anywhere in the world. Results of all investigations and aggregated learning should be published. The concept of *Never Events* is well established in health care and their occurrence triggers investigation, open publication of the outcome, and regulatory action. Again this recommendation, once implemented, will be of great value in the transition phase beyond interrupting transmission of wild poliovirus.
4. The GPEI at global level should closely monitor cross-border immunisation campaigns involving the Pakistan and Afghanistan Polio Programmes. Any failure of synchronisation, even of a single campaign, should trigger an emergency teleconference between country Programme leaders and global Programme leaders.
5. The GPEI should develop and publish a communications strategy on how it intends to handle communication of vaccine-derived poliovirus outbreaks after initial interruption of transmission of wild poliovirus.

CONCLUSIONS AND RECOMMEN- DATIONS

6. The GPEI should distil a list of the most effective metrics derived from social data and the most effective social data driven interventions from over the past decade.
7. The GPEI should ensure that there are adequate resources for the Programme in 2018 and that there is no reduction in expenditure in high-risk countries (e.g. Somalia and Yemen).
9. The Pakistan Polio Programme should look critically at the speed of implementation of response to the appearance of environmental-positive poliovirus samples. Rapid, comprehensive and effective action in days, not weeks, should be the golden rule.
10. The Government of Pakistan should overhaul visa approval arrangements so that *bona fide* essential polio advisers and Programme leaders have their visas approved in a period of days.

Countries

Pakistan and Afghanistan

8. The District Commissioner for Killa Abdullah should take assertive control of the response to polio in his district, particularly the Chaman subdivision. He should be aware that he is presiding over a jurisdiction that is one of the worst polio trouble spots in the world. In addition to scaling up tried and trusted Polio Programme methods, he should seek to alleviate the paucity of municipal and wider health services to the poorest areas (e.g. safe water provision, primary health care services, and other goods and services that are felt needs of the community for which delivery can start very soon). Coupling this with polio vaccine creates a *PolioPlus* package, valued by local communities, that has been a breakthrough strategy in other parts of the world.

11. A fresh initiative should be launched to achieve more sustained access in the south of Afghanistan.

Nigeria

12. The Government of Nigeria, including the President and State Governors, should publically reiterate their continued support for and specific commitment to both the Polio Programme and routine immunisation. This statement should have the same status as the previous Abuja Commitments.
13. A new compact should be agreed between the Nigerian military and the Polio Programme. The military should commit to placing the humanitarian needs of the Polio Programme as one of their highest level strategic and operational goals in Borno.



CONCLUSIONS AND RECOMMEN- DATIONS



- 14.** In Nigeria, funding for the Polio Programme should be balanced in allocation and releases so as not to be undercut by the push for increased routine immunisation funding. Both are necessary for polio transmission to be stopped.

Democratic Republic of Congo

- 15.** The President of the Democratic Republic of Congo must ask for the outbreaks of vaccine-derived poliovirus inside his country to be declared as a Public Health Emergency of International Concern and must follow this through with greatly improved performance of vaccination and other core public health functions.

Syria

- 16.** In Syria, a third vaccination campaign should aim for broader coverage, especially given population movements following military operations.