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The War Against Polio: A Strategic Case Study of Eradication Efforts in Balochistan, Pakistan (2015–2018)

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The strategic reconfiguration of polio eradication operations in Balochistan, Pakistan from 2015- 2018 is discussed in this rigorous multi-dimensional case study. After a disastrous return of the virus in 2014, I was appointed as a Provincial Coordinator and the Emergency Operation Centre (EOC) implemented governance reforms and leadership. The paper discusses how the province battled wild poliovirus (WFP) in the "Quetta Block" - a high-risk viral reservoir - in the face of kinetic security threats, vaccine refusal and cross-border transmission dynamics with Afghanistan. Nomadic populations and frequent border crossings in everyday life allowed for the transfer of the virus in the high-risk areas of Karachi in Balochistan and Kandahar, giving rise to the "Conveyor Belt" phenomena. In response, the provincial government replaced routine health drives with a "National Emergency Action Plan" (NEAP) with "No Tolerance" administrative negligence policy and data-driven micro-planning. This governance step taken replaced "phantom coverage" data by verified indicators, e.g. 4,443 chronic refusal families within the Quetta Block, allowing surgical rather than general interventions. The EOC had a mixed strategy of theological and community involvement to confront vaccine refusals, which represent more than 50% of the reported incidence in 2015. The campaign featured Ulema issuing fatwas declaring that vaccination is Sunnah compliant and very important for prevention of harm. Local female Community Health Volunteers (CHVs) were hired to build trust in conservative Pashtun households. A robust security structure including the Pakistan Army and Frontier Corps contributed to keeping the campaign going despite the January 2016 suicide attack on a polio center. The paper outlines the "Conveyor Belt" approach, which involved upgrading the infrastructure at the Friendship Gate (Chaman border) in order to vaccinate hundreds of children every day and coordinated campaign dates with the Afghan health authorities in order to prevent cross-border evasion. Malnourished populations were also safeguarded through technological advances such as the Injectable Polio Vaccine (IPV) and solar- powered cold chains. This multi-faceted approach has brought down polio infections from 25 in 2014 to 7 in 2015 and refusal cases by 91%, paving a way for conflict zone eradication.

1. Introduction

1.1 The Global and National Context

Poliomyelitis, or polio, is still regarded as a Public Health Emergency of International Concern (PHEIC). The Global Polio Eradication Initiative (GPEI) was launched in 1988 and has seen the incidence of polio fall by more than 99 per cent across the world. Nevertheless, this final part of eradication still remains the biggest challenge. As of 2015, endemic circulation had been restricted to a few isolated areas, with Pakistan and Afghanistan remaining the major barriers to a polio-free world (The New York Times, 20 May 2018).

The persistence of wild poliovirus (WPV) in these two countries puts not only the people in these countries at risk, but also puts global health security at risk. The World Health Organization (WHO) has repeatedly declared the Pakistan-Afghanistan epidemiological region as a single reservoir, which requires efforts at a greater level of vigilance and operational intensity, in addition to routine public health measures (Khatoon et al., 2023). In 2014, there was a severe resurgence of the disease, with 306 polio cases being recorded, the largest number in 14 years (Dawn, 7 September 2015; Ansari et al., 2020). This rise was enough to invite international attention, which eventually resulted in the World Health Organization imposing travel restrictions on Pakistani nationals, effectively quarantining the country as a health hazard to the world (Naseer et al., 2024).

1.2 The Balochistan Challenge

Pakistan's geopolitical and epidemiological scenario shows that Balochistan is a particularly challenging territory facing problems such as vast area of desert landscape, a permeable international border, low literacy level and unstable security scenario. Historically, Balochistan has had quite low routine immunization coverage; in 2015 it was estimated that routine coverage was only 16% (Dawn, 16 October 2015). Consequently, a significant proportion of children were left vulnerable to preventable life-threatening infections creating an environment for viral growth.

The province is a key transmission corridor, commonly referred to, epidemiologically speaking, as a "conveyor belt" for poliovirus linking high-risk areas in Karachi, Sindh, to Kandahar, Afghanistan (Dawn, 1 November 2014; Al Lawati et al., 2024). The interconnection observed implies that eradication activities within the region are not purely localized medical, but represent a complex socio- political activity, which requires the same level of precision as military operations, as well as diplomatic cooperation among different community groups (Ivascu et al., 2022). Moreover, there is high mobility among the population, which includes nomadic tribes (Powiandahs) and seasonal labourers who constantly cross district and provincial boundaries, thus contributing to the spread of the virus.

1.3 The Turnaround: 2015–2018

The period from 2015 to 2018 was a massive paradigm shift in the historical line of eradicative efforts in Balochistan. Consequently, the provincial administration has reinvented its strategic approach in response to the devastating outbreak in 2014, which overlapped with the freshly acquired leadership in the Emergency Operation Centre (EOC) (Khatoon et al., 2023). This epoch stood as a departure from ordinary health programmes towards the implementation of a "National Emergency Action Plan" (NEAP), an improved, high frequency communication approach that established a "zero tolerance" policy towards negligence (Balochistan Express, 21 October 2015; Farooq et al., 2020).

The operating environment was extremely hostile- the polio workers were being threatened with death by militant groups that promoted the idea that vaccination programmes were a ploy for espionage or a plot to sterilize Muslim children (Al Jazeera, 29 May 2014; Feng et al., 2023). This threat materialized in a devastating suicide bombing at a polio centre in Quetta in January 2016 which resulted in the death of 15 persons, mostly security officers in charge of security for vaccinators (Dawn, 13 January 2016; Farooq et al., 2020). Despite this violence, the campaign continued, supported by a massive communications campaign to mitigate refusals as well as an intensive accountability system.

This case study focuses on the holistic approach taken in Balochistan during this period, which highlights the role of the provincial apparatus in ensuring that religious experts' support is incorporated in addressing theological objections, the support of the Pakistan Army and Frontier Corps in controlling transit points along Pakistan's border with Afghanistan, and the use of data- based micro planning in monitoring unvaccinated children.

2. Literature Review

2.1 Epidemiological Context

In order to understand the importance of interventions taken during this period, a preliminary look at the epidemiological dynamics of poliovirus in Balochistan is needed. The province functioned in a broader and connected virologic context that included Karachi (Sindh), Khyber Pakhtunkhwa (KP), and the southern parts of Afghanistan.

2.2 The “Quetta Block” Reservoir

Epidemiologists and public health experts always identify "Quetta Block" of the districts of Quetta, Pishin and Qila Abdullah as a chronic risk area. This region is densely populated and is the economic and transportation centre of the province. In 2015, in spite of intensive vaccination campaigns, environmental samples collected from sewage in the Quetta Block were tested positive for Wild Poliovirus (WJP) repeatedly. Data from 2015 suggested that Balochistan often became a recipient of the viral importation and a reservoir. Official research has shown that the virus that was circulating in Balochistan had consistent genetic linkages to Karachi and Afghanistan. A polio case affecting a 30-month-old child in Quetta

was linked through DNA sequencing to Gadap Town in Karachi in February 2016 (The Express Tribune, 26 February 2016; Ivascu et al., 2022). This sequencing provided a lot of evidence for the constant undercutting of local eradication initiatives by re-infection from elsewhere. I focused on this interconnectivity observing that virus found for sample analysis in the environment did not often match the indigenous strains but rather imported there were "Karachi connects with Balochistan and there would be issues if the situation did not improve in Karachi" (Relief Web, 15 December 2015).

2.3 The Conveyor Belt Phenomenon

The "Conveyor Belt" concept is necessary to understand the region's epidemiology. Virus dissemination happens via human mobility. Nomadic groups who migrate from high altitude areas of Balochistan to temperate lowlands of Sindh and Punjab on an annual basis serve as carriers. In addition, there are numerous daily crossings of the Pak-Afghan border, which is part of a continual cycle of transmission. Consequently, eradication efforts will have to go beyond fixed vaccination areas to include mobile transit points to reach these transient populations (Balochistan Express, 15 April 2016).

In 2014, official statistics showed that 20% of polio cases in KP were linked to Karachi, and a similar link was found between the province of Balochistan and Karachi (Dawn, 1 November 2014; Hafeez et al., 2011). This required a national coordinated response. Leadership recognized that fixing the "Quetta Block" would be useless if the virus kept seeping from the "Karachi Reservoir."

2.4 The Burden of Disease and Union Councils at High Risk

In the year 2014, 25 polio cases were recorded in Balochistan. By late 2015, thanks to stepped-up efforts, the number of yearly recorded cases had reduced to seven (Dawn, 1 January 2016). While this numerical decline is significant, the existence of the virus in the environmental samples, especially sewage water tested from locations such as Qila Abdullah and Western Bypass of Quetta, suggested that circulation of the virus persists though the number of paralysis cases among children has declined (The Nation, 15 February 2016).

Provincial authorities classified 51 Union Councils (UCs) as "High Risk" which are mostly located in the Quetta Block (Dawn, 25 May 2015; Khatoon et al., 2023). These areas had high refusal rates, high population density, and high mobility of Afghan refugees. Data from 2015 indicate that about 50% of the reported cases of polio in Balochistan were categorized as "refusal cases", i.e. cases of infants whose parents explicitly refused vaccination (Relief Web, 7 September 2015). This change made the epidemiological challenge of accessibility (reaching rural populations) for acceptability (convincing parents)

2.5 The Afghan Factor

The epidemiological situation was further worsened by the permeable Pak-Afghan border. Given that Afghanistan is the only neighboring country to Pakistan that has a

widespread polio burden, cross border migration was a critical vector. In 2015, it was estimated that more than 14,000 people crossed the Friendship Gate at Chaman every day, including around 900 children under the age of five (Dawn, 5 November 2015; Naseer et al., 2024). Initial evaluations showed that vaccination teams couldn't reach some 300 of these children every day because of lack of resources and infrastructure at the border Dawn, 5 November 2015; Shabbir et al., 2021). The "re-seeding" of the virus had hinted that, despite temporary immunity of Balochistan, new strains of the virus could be brought at any time from Kandahar or Helmand provinces in Afghanistan (The Express Tribune, 26 February 2016).

3. Methodology

The proposed study utilizes a qualitative descriptive case study design focusing on polio eradication activities in Balochistan, Pakistan, in the timeframe 2015-2018, as a critical case due to incessant wild poliovirus transmission, conflict relations, and cross-border epidemiological interrelationships with Afghanistan. This research ensured the application of a thematic and process-tracing theoretical framework to examine how governance reforms, leadership and accountability frameworks, data-informed micro-planning, security, community outreach through religious leaders and Community Health Volunteers

4. Results and Discussion

4.1 Strategic Leadership and Governance Reforms

The turning point in the polio eradication efforts in Balochistan in this period could be attributed to a major shift in governance and accountability. As I was given the charge of Provincial Coordinator of EOC, Balochistan, I adhered to strict management approach, through strict monitoring with evidence-based decision making based on data available while taking strict actions against negligence in pre, post and during polio campaign

4.2 Setting Up the Emergency Operation Centre (EOC)

Before 2015, polio eradication efforts were disjoint. The Department of Health, as well as the World Health Organization (WHO) and UNICEF often worked in isolation, leading to task duplication and poor communication. The establishment of the Emergency Operations Centre (EOC) was an innovation in organization that was designed to centralize authority. The EOC brought all stakeholders together in one place to ensure real-time coordination (The News, 2 January 2015; Sibt-e-Ali et al., 2021).

This centralization allowed for a quick reaction. Upon notification of a polio case, the Emergency Operations Center (EOC) may immediately mobilize Case Response Teams (CRTs) and mount intense "mop up" efforts within the relevant Union Council. The EOC also introduced the "National Emergency Action Plan" (NEAP), which mandated nine high-quality programs within one year to administer repeat doses to youngsters and fill in

immunity gaps (Dawn, 2 December 2015; Taqi et al., 2022). I used this technology to carry out careful analyses of campaign data that transformed the EOC from a mere meeting venue into a command-and-control center.

4.3 The "No Tolerance" Policy and Accountability

One of the hallmarks of this age was accountability. Historically, there have often been little repercussions to government leaders for insufficient campaign results. In October 2015, I presidedover a meeting of the Vaccine Management Committee where he unequivocally stated, "EOC will not tolerate any laxity on the part of officials in managing the anti-polio vaccines and laxity will not be tolerated" (Balochistan Express, 21 October 2015).

This was not mere rhetoric. The administration began to place a measure of individual accountability on District Health Officers (DHOs) and Deputy Commissioners (DCs) for the quality of campaigns in their respective domain. In response to a new polio case in Quetta in July 2015, the EOC convened an emergency meeting in which the Health Secretary ordered departmental action against the DHO and suspended those who neglected to address the refusal case (The Express Tribune, 10 July 2015).

This cultural transformation was critical because the polio drive in Pakistan has witnessed "phantom coverage" since official statistics show high vaccination rates despite the continuing transmission of the virus. As the Provincial Polio Coordinator, I was the one pushing for the need for independent monitoring, candidly admitting to less-than-ideal results, and stating in interviews afterward, "The worst thing you can do in this scenario is try to paint a rosy picture" (The New York Times, 20 May 2018). The transparency implemented helped the system to appropriately deal with shortfalls.

4.4 Micro Planning and the Emphasis on Missed Children

The leadership had the recognition that the aggregate statistics of coverage usually hid specifics of deficiency. A coverage rate of ninety five percent (95%) may seem quite satisfactory; however, if the five percent (5%) are concentrated into a high-risk enclave, continued transmission of the virus may exist. Consequently, the strategy was limited to "micro-planning," which involves the complete mapping of all households in high-risk areas.

In September 2015, list of refusal parents in Quetta block has been thoroughly documented. All the 4,443 children documented in Quetta, Pishin and Qila Saifullah were administered anti-polio drops. In a meeting to review the investigation of newly emerged polio case in Quetta which brought the total number of cases in Balochistan to 5 in this year of 2015 (Balochistan Express, 7 September 2015). At least 4,443 cases of refusal vaccination refusal were recorded in Balochistan's Quetta, Pishin and Qila Abdullah districts and the children who were documented will be administered polio vaccines. Out of the 4,443 refusal cases, around 1,762 cases have been reported in Zarghon, 1,219 in Quetta's Chiltan Town, 719 in Pishin Tehsil, 133 in Karezat Tehsil of Pishin district while 159 cases were

recorded in Chaman Town which borders Afghanistan, and 153 cases in Tehsil Qila Abdullah of Qila Abdullah district (Dawn, 7 September 2015). This documentation led to focused interventions: instead of generic awareness interventions, dedicated teams made up of Deputy Commissioners and religious experts went to the individual residences of these 4,443 families to persuade them.

4.5 The Battle for Hearts and Minds: Dealing with Refusals

The single major obstacle in polio eradication in Balochistan was parental refusal for immunization, which was often based on religious beliefs or political distrust. Within some conservative elements of the Quetta Block a hard-hacked belief existed about the vaccine being "Haram" [forbidden] or part of a Western conspiracy aimed at subduing Muslim people.

4.6 Measuring the Crisis of Refusal

In 2014, refusals were 44 per cent of all polio cases reported from Balochistan. By 2015 this proportion had increased to more than 50 per cent of the recorded cases (Relief Web, 7 September 2015). This escalation was alarming because it implied that the virus was disproportional in affecting children whose parents actively sought to protect the well-being of their children by other means.

A sad example of this phenomenon was the case of five-year-old Gul Afsha, who was disabled in 2015. Her father, a medical technician, refused to vaccinate her based on his religious belief. I publicly criticized this decision, saying that "it is exceedingly tragic that a medical technician has been rejecting vaccination" This statement highlighted that refusals were not restricted to ill- informed people; rather, they prevailed among various social strata based on ideological beliefs (Dawn, 7 September 2015).

4.7 Theological Engagement: The Role of Ulama

Recognizing the insufficiency of governmental mandates in influencing religiously motivated refusals, I, in conjunction with the EOC, enlisted the "Ulema" - religious scholars and clerics, as primary advocates. In August of 2015 the EOC organized a conference that included some distinguished scholars like Maulana Anwarul Haqq Haqqani and Dr. Atta Ur Rehman (Balochistan Express, 5 August 2015).

The strategy was to use religious authority to overcome doctrinal objections. The scholars issued decrees (fatwas) and public statements explaining three basic theological points:

Alignment with Sunnah: Vaccination is in line with the practice of the Prophet Muhammed (PBUH), who promoted preventive measures against disease (Dawn, 5 July 2015).

Harm Prevention: Islam is obligated with the protection of the child from harm; a refusal to use a vaccine to prevent paralysis is equivalent to neglect.

Hajj Precedent: They emphasized that Hajj pilgrimage requires compulsory vaccination to make the medical practice acceptable in the most sacred Islamic context (Dawn, 5 July 2015).

These scholars did not simply serve in a symbolic capacity, but were formally included in the Refusal Coverage Committees. They accompanied immunization teams to homes of persistent refusers. The impact was palpable. As a result of a campaign in November 2015, the government claimed a 91% reduction in refusal incidents because the parents of 12 607 children had been successfully influenced by these committees (Dawn, 24 November 2015). This result showed that in a strongly religious society, spiritual support was as important as the vaccine itself.

4.8 Community Health Volunteers (CHVs)

A subsequent strategic adjustment was made by recruiting local Community Health Volunteers (CHVs), especially women, to replace the external people. In the traditionally Pashtun areas of Balochistan it is often considered culturally inappropriate to allow male strangers inside private homes. Using local women who knew the community well significantly increased access to the homes. The government entrusted such CHVs to function effectively in high-risk Union Councils, thereby bridging the trust deficit (Dawn, 2015, 2 December).

4.9 The “Criminalization” Debate

I took a strong public stance about refusals, stating that "individuals who refuse to administer polio drops should be considered criminals and offenders" (Dawn, 7 September 2015). Although actual arrests were rare and usually used as a last resort, this rhetoric did have a purposeful function: it redefined the act of non-vaccination from being a "personal choice" to being made a "public health crime" that posed a threat to the community. This pressure, along with what political scientists call the soft power of the Ulema, significantly reduced the number of refusals.

4.10 Security Dynamics in the Polio Eradication Campaigns in Conflict Zones

The Balochistan geopolitical context in 2015-2018 created a unique challenge in relation to public health initiatives, which stems from the intersection of an agenda to eliminate diseases and the agenda to counter terrorism. The transmission of poliovirus in Pakistan has often been made worse by ongoing insecurity and in areas where health workers have been unable to reach, the virus remains circulating. In Balochistan the dual threat, both kinetic and human, required the integrated operation framework that included the Civilian Administration, Law Enforcement Agencies (LEAs) and the Military.

4.11The Threat Matrix

Polio personnel were viewed at times as state agents or foreign intelligence agents by militant organizations, such as the Tehreek-i-Taliban Pakistan (TTP). This

mischaracterization resulted in purposeful assassinations, abductions and explosive attacks. Although the government promised comprehensive security for workers in 2015, the level of threats remained high (Dawn, 4 August 2015).

4.12 The January 2016 Suicide Attack

The security threats that face the polio staff was more than just theoretical infect alarming. On 13 January 2016 a suicide bomber detonated in a polio vaccination centre in Satellite Town, Quetta, killing at least 15 people, most of them police officers tasked with guarding vaccination teams. The TTP and Jaishul Islam claimed responsibility for it and presented the attack as retaliation against the state (Dawn, 13 January 2016).

This event provided a significant test of the operational capacity of the Emergency Operations Centre (EOC) leadership. In similar incidents, the usual tactical response is long-term stopping of activities, which can lead to a potential reemergence of the virus. Nevertheless, a plan for "Strategic Resilience" was put into place. Despite the devastation, the campaign in Quetta was immediately restituted in unaffected areas, as well as a swift re-start in the affected zone thereafter. The interventionist stated that, "Such acts of terror cannot undermine our determination to eradicate polio" (Dawn, 13 January 2016). This decision was crucially important and was a signal to insurgent groups that violence would not lead to the program being terminated, reducing the strategic efficiency of such attacks.

4.13 Coordination of the Civil and Military

The EOC developed a framework for security which involved the highest levels of the provincial security apparatus and recognized that the health department could not operate in isolation. Meetings were held with the Commander of Southern Command, Lieutenant General Aamir Riaz who assured Army support for ongoing operations (The Nation, 15 February 2016).

The security strategy for the "Quetta Block" was a multi-layered approach:

- **Police:** In charge of interior cordon security of mobile units working in urban areas.
- **Balochistan Levies:** Responsible for maintaining security in rural and semi-autonomous tribal areas where the police can only be used as a last resort (Balochistan Express, 11 August 2015).
- **Frontier Corps (FC):** They Establish an external perimeter and protect the vital targets, including Permanent Transit Points (PTPs) on the border.

In 2015, the Home Department passed Section 144 which bans gathering in public or pillion riding of motorbikes during campaign days. This targeted countermeasure was intended to reduce "drive- by" gunshot attacks, a common tactic used by motorcycle-borne terrorists against health personnel (Dawn, 3 August 2015). The securitization of health initiatives was an essential compromise; although it arguably militarized a humanitarian endeavor, without such an "iron shield," the EOC said, the 2.4 million children identified in the province could

not be accessed in a secure manner.

4.14 The "Conveyor Belt" Strategy: Interventions at the Border and at Transit

Epidemiological modelling showed that static campaigns of vaccination were inefficient in the context of constant population mobility. The "Conveyor Belt" hypothesis argued for the spread of the poliovirus between Afghanistan and Pakistan through the Friendship Gate at Chaman and between Balochistan and Karachi via the RCD Highway.

4.15 The Friendship Gate (Chaman) Intervention

Chaman border crossing is one of the busiest land crossings in the region. In 2015 over 14,000 people crossed every day, including about 900 children under the age of five (Dawn, 5 November 2015). Preliminary audits carried out by the Emergency Operations Centre (EOC) showed a large disparity: Vaccination teams at the border were only vaccinating 600 children a day, leaving about 300 potentially unvaccinated children to cross the border each day.

To combat this problem, an extensive revision of the border strategy was undertaken:

- **Continuous Vaccination:** Change schedules were made to cover every hour of the border operations.
- **Infrastructure Enhancement:** Rotary International was commissioned to upgrade the physical infrastructure - containers, cold-chain storage, shade - at the Friendship Gate which had previously been described as "substandard" (Dawn, 5 November 2015; Dawn, 30 May 2015).
- **Zero-Tolerance Crossing:** A strict policy was adopted under which no family would be allowed to enter or leave the country through the Pak-Afghan border unless children under the age of five were vaccinated. Civil administration and security personnel were given the authority to check vaccination cards (Balochistan Express, 15 April 2016).

4.16 Cross Border Synchronization with Afghanistan

Transmission of polio virus ignores national boundaries. In November 2015, I led a delegation to Chaman to meet with Afghan public health officials, including the Afghan Minister of Public Health, Faizullah Kakar. This diplomatic initiative culminated as a "Joint Anti-Polio Strategy" (Dawn, 5 November, 2015).

Major outcomes of this collaboration were:

- **Synchronized Campaign Dates:** Immunization drives in Kandahar (Afghanistan) and Quetta (Pakistan) have been set at the same time, thus making it difficult for populations to cross the border in order to avoid immunizing during a campaign period.
- **Data Sharing:** A system of dissemination of monitoring data related to viral genomic

clusters detected in environmental samples was created.

- **Religious Consensus:** Both groups agreed to use the same "Fatwas" (religious rulings) from world-renowned scholars to resolve refusals on either side of the Durand Line (Dawn, 5 November 2015).

4.17 Permanent Transit Points (PTPs)

Beyond the international boundary, the EOC acknowledged internal migration pathways as being high risk vectors. Nomadic tribes, commonly called Powindahs periodically move in a circuitous manner of Afghanistan, Balochistan and Punjab. The government set up 46 operational Permanent Transit Points (PTPs) at key inter-district and inter-provincial linkages to intercept them (Balochistan Express, 20 August 2015).

Particular attention was paid to the boundaries with Sind and Punjab (districts of Jafferabad, Naseerabad, Jhal Magsi) because of the periodic movement of agricultural labourers. Instructions were issued for increased monitoring at these locations to prevent the virus circulating in Karachi from re-infecting Balochistan, and vice versa (Balochistan Express, 15 April 2016).

4.18 Technical Innovation-The Introduction of IPV

In 2016 it became clear that it was impossible to close the immunity gap in high-risk regions with the Oral Polio Vaccine (OPV) on its own. Malnutrition and recurring diarrheal disease among children in Balochistan were limiting the efficiency of oral administration because the gastrointestinal tract often failed to absorb the vaccine properly. Under the direction of Technical Advisory Group (TAG), Balochistan started the implementation of Injectable Polio Vaccine (IPV).

4.19 The IPV Campaign Strategy

In April 2016 a large scale IPV initiative was launched focusing on the highest risk districts of Quetta, Pishin and Qila Abdullah. The operation proved logistically complex in that IPV requires trained vaccinators to administer the injections while OPV can be given by volunteers. The goal of the campaign was to add to the immunity provided by oral drops.

Targeted Demography: The program was directed mainly towards children between 4 and 23 months of age, in which 85% of polio cases were reported (Balochistan Express, 15 August, 2016)

Refugee Focus: IPV programs were developed for refugee camps in Afghanistan. In August 2016 a concerted effort was made in four major camps in the Chaghai district (Balochistan Express, 15 August 2016) targeting 6,830 children.

Rationale: The presumption was that IPV would provide better immunity to those children missed by OPV, or who have impaired absorption. Recent cases in Quetta were in children who had not been given IPV in 2015; according to a statement of an observer, "Had we

vaccinated these children with IPV, there would have been no cases" (Balochistan Express, 15 August 2016).

4.20 Overcoming Logistics

The introduction of IPV required a major strengthening of the cold chain infrastructure, due to the increase in the sensitivity of the vaccine to temperature changes. The Emergency Operations Centre worked with UNICEF to distribute solar-powered refrigerators in rural areas of Chaghai and Pishin to maintain the integrity of the vaccinations. This technical improvement did not only help the polio initiative, but also strengthened the wider Expanded Program me on Immunization (EPI) in the province.

4.21 Discussion Analysis of Efficacy and Challenges

The period of 2015-2018 in Balochistan is a major research in "Crisis Leadership" and "Adaptive Management." The empirical evidence shows a heterogeneous and favoring trend. In 2014, there were around 25 incidents in the province. By the end of 2015, this number had fallen to seven (Balochistan Express, 10 November 2015).

4.22 Success Factors

The reduction in the number of reported cases can be accounted due to the three major factors:

Reduction in Refusals: Employing a dual approach of obtaining the cooperation of the Ulema and a systematic approach to documenting refusals reportedly claimed to have reduced the number of polio vaccination refusals by more than 91 per cent in the province by the end of 2015. This result demonstrated that resistance was not based upon a hardened ideological view but on the absence of credible engagement. As a result, acceptance followed as religious leaders and local women addressed the "trust deficit." (Dawn, 24 November 2015).

Operational Rigor: The tendency from "phantom data" to validated micro-plans with precise identification of 4,443 refusal families led to shift of the initiative from general widespread awareness campaign to a specific operation. The ability to track individual children at the Emergency Operations Center represented a tremendous leap in administration efficiency. (Balochistan Express, 7 September 2015).

Resilience to Terror: This quick restart of insurgent operations after the January 2016 explosion undercuts the perpetrator's goal of crippling the health infrastructure. This persistence was an example of the state's aggressive determination to stick with its position. (Dawn, 13 January 2016).

4.23 Persistent Challenges

Notwithstanding these accomplishments, the pathogen has proven to be resilient. The Quetta polio case had its origins in Karachi. The virus found in the 30-months old boy from the Samungli area of Quetta, did not match samples of the virus found in local sewage lines.

The boy was diagnosed with the virus three days ago, is the first reported case in Balochistan province in 2016. DNA sequencing has proven that the virus originated from Gadap, Karachi. it did not matter if the boy visited Karachi or not, as someone carrying the virus came in contact with the boy and he contracted the virus. Based on DNA sequencing it has been determined that the polio virus found in the environmental sample from Hadi Picket of Qila Abdullah District is from Helmand, Afghanistan. Environmental samples from Qila Abdullah and Quetta tested positive for WPV intermittently with strains that are often associated with strains from Afghanistan or Karachi. Such a trend represents the inadequacy of a provincial approach amid both national and regional dangers. As long as the virus still has Karachi and Kandahar reservoirs with it, Balochistan stands the chances of being reinfected. (The Express Tribune, 26 February 2016). The long-term viability of police officers employing thousands of law enforcement officers to implement public health campaigns is the subject of legislative discussion.

4.24 The Legacy of "No Tolerance"

The "No Tolerance" strategy put in place proved to be beneficial for both short and long term by implementing considerable monitoring over the district authorities. Therefore, the implementation of an independent monitoring and environmental sampling served to play a protective role, assuring that the ensuing pressure triggered performance gains instead of self-centered delusion (Balochistan Express, 21 October 2015).

5. Conclusion

Eradication of poliomyelitis in Balochistan does not only present a medical issue but also an analysis of governance, diplomatic relations and management of security. The period of the Provincial Coordinator (2015 till 2018) presented a paradigmatic approach towards dealing with this public health crisis. The provincial administration recognized the gravity of the situation and organized the relevant resources by redefining the initiative as an Emergency Operation and not the traditional health program me. The present case study highlighted that the Community Engagement through Ulema and Community Health Volunteer, Cross-Border Diplomacy through the strategy of Joint Pak-Afghan, and a stance of uncompromising accountability along with the "No Tolerance" policy are the three indispensable pillars for the elimination of the virus in conflict settings. Considering the decline of cases identified, its highlighted that despite the adverse circumstances, including terrorism, open borders, and deeply held misconceptions, deliberated and well-coordinated human efforts can successfully fight against the spread of disease. The establishment of Emergency Operations Centre framework and the integration of religious leaders along with community leaders remained core for the polio eradication in Balochistan.

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