Loyola University Chicago International Law Review

Volume 13 | Issue 1 Article 4

2016

Fighting Against The Reemergence of Polio in the Federally Administered Tribal Areas of Pakistan

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I. Introduction

In the backdrop of Pakistan's internal struggle to combat Islamic extremism, narrow the socio-economic inequality gap, and adequately care for over a million internally displaced people and refugees, another problem has quietly been brewing. The reemergence of polio in Pakistan has threatened to derail decades of work by the international community in eradicating the disease, and is on the verge of plunging Pakistan into another major public health crisis.

Since 2000, Pakistan has implemented over 130 polio-immunization campaigns.[1] Despite their efforts, Pakistan is one of the last reservoirs of Polio in the world, along with Nigeria and Afghanistan.[2] The Federally Administered Tribal Ares of Pakistan (FATA), a lawless, semi-autonomous region of Pakistan bordering Afghanistan, hosts a large percentage of the world's polio cases.[3] It is from this region that polio outbreak threatens to burst out of control. Pakistan now lags behind every other country in the world in eradicating polio, and without drastic measures, the surge in polio cases in Pakistan could threaten to create a global public health crisis.

[1] Zulfiqar A. Bhutta, *Polio Eradication Hinges on Child Health in Pakistan*, 511 Nature 285, 286 (2014).

[2] *Id.* at 285.

[3] Leslie Roberts, *Fighting Polio in Pakistan*, 337 Science 517, 519 (2012).

This paper examines the rise of Polio in Pakistan and the international, national, and district level responses to combat its reemergence. Part II provides background information on the Federally Administered Tribal Regions of Pakistan and the global strategy to eradicate Polio in the country. Part III discusses in detail the roadblocks being faced by health workers in Pakistan in successfully implementing vaccination programs. Part IV analyzes the effectiveness and weaknesses of the current strategies being employed to eradicate polio in Pakistan, and Part V proposes a hybrid of solutions which allow for the effective monitoring and implementation of eradication proposals.

II. Background

A. Federally Administered Tribal Areas of Pakistan

Pakistan and Afghanistan share a rugged and porous border. The mountainous regions on both sides of the border are strife with Islamic extremism, and the area is often referred to as the 'grand central station of global Islamic militancy.'[4] The Federally Administered Tribal Areas of Pakistan (FATA), the area of Pakistan that borders Afghanistan, has become a safe-haven for Afghani and Pakistani militants.[5] Arguably, neither the Pakistani government nor the military have control over the area, and control of FATA is effectively managed by prominent Islamic Pushtun leaders.[6]

FATA's population is virtually entirely Pashtun.[7] FATA is divided into seven different administrative agencies, including Khyber, South Waziristan, and North Waziristan, where a majority of polio cases have arisen.[8] For over a hundred years, the area has been governed by its own set of colonial-era laws called the Frontier Crimes Regulation.[9] Laws passed by Pakistani Parliament do not apply in FATA, unless the president so directs, and FATA falls outside of the jurisdiction of Pakistan's Supreme and High Courts.[10] The Supreme Court, in recognizing the unique circumstances and traditions of the Pashtuns, noted that the laws for the area are "so that their inhabitants are governed by laws and customs with which they are familiar and which *suit their genius.*"[11]

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[4] Joshua A. Kurtzman, *Pashtunistan's Future: The Global Executive or a Regional Solution*, 21 IND. J. GLOBAL LEGAL STUD. 303, 308 (2014).

[5] Tayyab Mahmud, *Colonial Cartographies, Postcolonial Borders, and Enduring Failures of International Law: The Unending Wars Along the Afghanistan-Pakistan Frontier*, 36 BROOK. J. INT'L L. 1, 47 (2010).

[6] *See* Kurtzman, *supra* note 4, at 313.

[7] *See* Mahmud, *supra* note 5, at 55.

[8] *Id.* at 57.

[9] *Id.* at 55-56.

[10] *Id.* at 56.

[11] *Id.* at 57.

B. Polio Eradication in Pakistan

Against this backdrop, public health initiatives in FATA have been difficult, particularly with polio eradication. Polio causes "acute flaccid paralysis," affecting young children at an early age.[12] There is no cure for the polio disease, "which enters the body through the mouth, proliferates in the intestine then invades the central nervous system, destroying cells that activate muscles. . . caus[ing] irreversible paralysis."[13] There are three types of Polio: Type 1, Type 2, and Type 3.[14] Although Type 2 has been eradicated, Type 1 and Type 3 still linger.[15] Vaccines have been made that combat all three types of polio at once, though studies have shown that trivalent oral polio vaccines have "decreased effectiveness against individual strains."[16] As the virus is extremely contagious through the spread of contaminated fecal matter, a single case can put the entire world at risk.[17] In other words, if eradication fails in Pakistan, then the decades long campaign, in which over $10 billion has been spent, would have failed.[18]

To date, seven major eradication programs have been attempted against a variety of diseases, with only the fight against smallpox being successful in its total eradication.[19] The majority of developed nations largely eliminated traces of the polio virus by the 1970s.[20] By the late 1980s, 350,000 people in 125 countries were effected by the virus.[21] In 2010, 75% of the cases were in conflict-ridden areas, primarily in Pakistan, Afghanistan, and Nigeria.[22] By 2013, significant progress was made, as only 160 endemic cases were reported, with a majority of them originating in only Pakistan, Afghanistan, and Nigeria.[23]

The largest and most prominent international organization at the forefront of polio eradication has been the Global Polio Eradication Initiative, established in

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[12] April Chang et al., CTR. FOR STRATEGIC & INT'L STUD., ERADICATING POLIO IN AFGHANISTAN AND PAKISTAN 3 (2012), http://csis.org/files/publication/120810_Chang_EradicatingPolio_Web.pdf.

[13] Jon Boone, *Pakistan's Polio-Busters Try to Contain Disease Despite Terrorist Opposition*, THE GUARDIAN (July 3, 2014, 11:12 AM), http://www.theguardian.com/world/2014/jul/03/pakistan-polio-busters-disease-terrorist-opposition.

[14] Svea Closser, *"We Can't Give Up Now": Global Health Optimism and Polio Eradication in Pakistan*, 31 MED. ANTHROPOLOGY: CROSS-CULTURAL STUDIES IN HEALTH & ILLNESS 385, 392 (2012).

[15] *Id.*

[16] Tariq Khan & Javaria Qazi, *Hurdles to the Global Anti-polio Campaign in Pakistan: An Outline of the Current Status and Prospects to Achieve a Polio Free World*, 67 J. EPIDEMIOLOGY & CMTY HEALTH 696, 699 (2013).

[17] *See* Roberts, *supra* note 3, at 517-518.

[18] *Id.*

[19] See Closser, *supra* note 14, at 385.

[20] *Polio in Pakistan: Paralysis*, THE ECONOMIST (Oct. 15, 2011), http://www.economist.com/node/21532333.

[21] *See* Bhutta, *supra* note 1, at 285.

[22] *See* THE ECONOMIST *supra* note *20.*

[23] Edna K. Moturi et al., *Morbidity and Mortality Weekly Report: Progress Toward Polio Eradication – Worldwide, 2013-2014*, CENTERS FOR DISEASE CONTROL AND PREVENTION, (May 30, 2014), http://www.cdc.gov/mmwr/preview/mmwrhtml/mm6321a4.htm.

1988.[24] It has helped to reduce worldwide levels of polio by 99%, and has allowed over 10 million people to survive who otherwise would have been affected by the polio virus.[25] The Global Polio Eradication Initiative consists of a variety of stakeholders, including the World Health Organization, Rotary International, UNICEF, USAID, the Bill and Melinda Gates Foundation, and a multitude of non-governmental and donor agencies.[26] The organization focuses on four strategic pillars, which include "1) routing immunization, supplementary immunization, surveillance, and targeted 'mop-up' campaigns."[27]

For the period of 2013 – 2018, the Global Polio Initiative requires $5.5 billion to adequately address all aspects of their Pakistan program.[28] Its budget includes vaccinating 250 million children multiple times every year.[29] Specifically, the program calls for polio workers in Pakistan to routinely vaccinate children at birth, at six weeks, ten weeks, and at 14 weeks of ages for all children.[30] Teams go from door to door to administer vaccines.[31] Particularly for Pakistan, the Initiative's framework includes reducing the exposure of vaccinators to potential threats, enhancing cooperation between civilian and security services to provide local risk assessments, increasing community demand of the vaccinations, and providing religious leader advocacy at the local level to increase community involvement.[32]

Pakistan's anti-polio campaign is embodied in the National Emergency Action Plan for Polio Eradication, prepared by the government of Pakistan.[33] The plan establishes a multi-level organizational structure for implementing the polio initiative.[34] Essentially, the Prime Minister's office is the "main driving force" behind the anti-polio initiative in Pakistan.[35] Under the supervision of the Prime Minister, the focal person for polio eradication works in conjunction with the Prime Minister's Secretariat, the Office of the President, and the Ministry of Na-

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[24] GLOBAL POLIO ERADICATION INITIATIVE, WORLD HEALTH ORG., STRATEGIC PLAN 2013-18, 1, 1 (2013), *available at* http://www.endpolio.com.pk/images/reports/polio-eradication-&-endgame-strategic-plan1-2013-2018.pdf [hereinafter STRATEGIC PLAN 2013].

[25] *Id.*

[26] Rafael Obregón et al., *Achieving Polio Eradication: A Review of Health Communication Evidence and Lessons Learned in India and Pakistan*, 87 WORLD HEALTH ORG., 624, 624 (2009).

[27] *See* Khan, *supra* note 16, at 696.

[28] *See* STRATEGIC PLAN 2013, *supra* note 24, at 10.

[29] *Id.*

[30] Jason Beaubien, *The Hidden Costs of Fighting Polio in Pakistan*, NPR, (July 29, 2014), *available at* http://www.npr.org/sections/goatsandsoda/2014/07/29/335388814/the-hidden-costs-of-fighting-polio-in-pakistan.

[31] *Id.* at 3.

[32] *See* STRATEGIC PLAN 2013, *supra* note 24, at 9.

[33] *See generally* NATIONAL EMERGENCY ACTION PLAN 2014 FOR POLIO ERADICATION, NAT'L TASK FORCE OF POLIO ERADICATION (2014), *available at* http://www.polioeradication.org/Portals/0/Document/InfectedCountries/Pakistan/2014_NEAP_Pakistan.pdf [hereinafter NATIONAL EMERGENCY ACTION PLAN].

[34] *See id.* at 17.

[35] *See* Chang, *supra* note 12, at 4.

tional Health Services.[36] There is also a National Steering Committee, a Polio Monitoring and Coordination Cell, Polio Control Rooms, and a Vaccine Management Committee.[37] Polio Control Rooms are in each province, while Deputy Commissioners act as administrative heads at the district levels, and each tehsil, or small administrative area, has its own polio eradication committee.[38]

The National Emergency Action Plan for Eradication has over sixteen key goals, touching on both supply-side and demand-side issues.[39] The demand-side issues "mainly involve a sense of vigilance among local residents against outside (particularly Western) influences, while the supply-side issues mainly involve the non-receptiveness of the communities to the female vaccinators."[40] The plan calls for 'Short Interval Additional Doses,' the goal of which is to "rapidly build up population immunity" by providing doses in quicker intervals, particularly for Pashtun communities residing outside of FATA.[41] To address migrant and unsettled populations in FATA, the plan calls for an extensive research effort in understanding migration patterns, including data collection and mapping.[42] The plan expressly calls for greater community partnerships with FATA, by engaging with community leaders at all levels, and for using religious leaders as partners for anti-polio initiatives.[43] In addressing incentives for aid workers, the plan calls for a 'Direct Disbursement Mechanism' as the only payment method for aid workers, in the hopes that workers are paid on time and in the full amount.[44]

III. Discussion

In 2011, Pakistan became known as the "global epicenter" of the polio disease, with the most cases in the world.[45] The rise of polio cases in Pakistan has been attributed to a "perfect storm of all the problems that are Pakistan: poverty and illiteracy; a health system in tatters; ethnic and sectarian violence; a government struggling to deal with corruption and dysfunction; huge population movements; and, especially since 9/11, rising extremism and [an] anti-Western view. . ."[46]

This has been compounded by recent large natural disasters, including earthquakes and flooding, along with persistent conflicts that have created a non-exis-

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[36] *See* NATIONAL EMERGENCY ACTION PLAN, *supra* note 33, at 17.

[37] *Id.*at 18.

[38] *Id.* at 19.

[39] *See id.* (explaining that the National Action Plan broadly lists sixteen different goals for Pakistan's Anti-Polio initiative, many of which overlap; the relevant goals are discussed in this paper).

[40] Syed Q. Hassan et al., *Refusal of Oral Polio Vaccine in Northwestern Pakistan: A Qualitative and Quantitative Study*, 32 VACCINE, 1382, 1385-86 (2014).

[41] *See* NATIONAL EMERGENCY ACTION PLAN, *supra* note 33, at 30.

[42] *Id.*

[43] *See generally* NATIONAL EMERGENCY ACTION PLAN, *supra* note 33.

[44] *Id.*

[45] Roberts, *supra* note 3, at 517.

[46] *Id.* at 518.

tent public health infrastructure and the exposure of large populations to unsanitary conditions.[47]

By 2011, the majority of Pakistan's polio cases arose from a handful of distinct areas.[48] Since then, the outbreak of polio in Pakistan has been concentrated in four geographic areas: the city of Quetta in the province of Balochistan; the city of Peshawar in the province of Khyber Pakhtunkhwa; the city of Karachi in the province of Sindh; and the tribal areas of FATA.[49] Within these areas, there are 33 high-risk districts.[50] The tribal agency of North Waziristan, one of the seven tribal agencies of FATA, has more than half of the world's polio cases.[51]

Geographic and climate conditions have also not helped Pakistan, as "fecal-oral transmission of poliovirus is very efficient in Pakistan's hot climate, high population density, and poor water and sanitation infrastructure" conditions.[52] This problem contributes to low-dose efficiency in Pakistan, where children have to be vaccinated up to 10 times.[53] In FATA, high-levels of cross-border activity with Afghanistan, especially with refugees fleeing conflict, contributes to high levels of transmission.[54] The borders are a major problem for the transmission of polio with its lack of infrastructure, with nomads freely moving between both countries, and the lack of oversight by WHO and UNICEF officials due to no security arrangements in the area.[55] FATA's migrant Pashtuns, who comprise the majority of the population in FATA, are five times more likely to contract polio than other ethnic groups within Pakistan.[56]

The situation was not always so dire in Pakistan. Between 1994 and 2005, polio levels in Pakistan steadily dropped, and only began to spike in 2008.[57] To illustrate this, there were approximately 3000 cases of polio in Pakistan in 1980, and only 198 in 2011.[58] By 2011, the number of cases dangerously rose, in contrast to India which had only one reported case.[59]

Pakistan has had over 110 polio immunization campaigns since 1994.[60] Over 300 million doses are required annually to vaccinate Pakistani children.[61] For

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47 *See* Chang, *supra* note 12, at 6.

48 *See* Roberts, *supra* note 3, at 519.

49 Chang, *supra* note 12, at 4.

50 *See* Roberts, *supra* note 3.

51 *See* Boone, *supra* note 13.

52 Closser, *supra* note 14, at 388.

53 *Id.*

54 *See* Chang, *supra* note 12, at 2.

55 *See* Closser, *supra* note 14, at 391 (discussing work being done to establish more consistent vaccination practices along the border).

56 Chang, *supra* note 12, at 6.

57 *See* Roberts, *supra* note 3, at 518.

58 Chang, *supra* note 12, at 4.

59 *See* Chang, *supra* note 12, at 1.

60 Aatekah Owais et al., *Pakistan's Expanded Programme on Immunization: An Overview in the Context of Polio Eradication and Strategies for Improving Coverage*, 31 VACCINE, 3313, 3316 (2013).

61 Bhutta, *supra* note 1, at 286.

Pakistan, this requires immunizing 35 million children, six times a year.[62] However, the campaigns are estimated to only have a coverage of 88%, with the majority of the gaps of coverage in the tribal areas of FATA.[63] In the past two years, more than 450 million doses have been administered to Pakistani children.[64] In 2013, immunization rates for Pakistani children were at a meager 54%, compared to over 95% in Bangladesh.[65] However, that figure is likely to be largely overestimated, as the survey did not contain information from FATA.[66]

IV. Analysis

Pakistan's anti-polio initiative has been labeled as a "disaster."[67] Bluntly stated by the Independent Monitoring Board of the Global Polio Eradication Initiative, its October 2014 report described Pakistan's program as continuing to "flounder hopelessly, as its virus flourishes."[68] The report describes the present danger of the virus to Pakistan's neighboring countries, where reports of the virus have been traced back to Pakistan.[69] Strains of Pakistan's virus have also been found as far out as Syria and Iraq in 2013.[70] This paper examines three of the major issues regarding the failure of Pakistan's anti-polio initiatives: security, mismanagement, and misinformation.

A. Security

The Pakistani Taliban has continued a brutal campaign against the vaccination drive, often with deadly consequences. The deadliest incident occurred in December of 2012, where militants killed nine polio health workers, including five female volunteers.[71] In October of 2013, militants destroyed a medical distribution center for polio vaccinations, and in the process killed seven people.[72] In all, since December of 2012, more than 80 polio workers have been killed by the Pakistani Taliban in all parts of Pakistan.[73] As a result of the security situation and large exodus of people from the tribal regions of Pakistan, the epidemic has

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62 Roberts, *supra* note 3, at 518.

63 *See* Owais, *supra* note 60, at 3314.

64 Declan Walsh, *Polio Crisis Deepens in Pakistan, With New Cases and Killings*, N. Y. TIMES (Nov. 26, 2014), http://www.nytimes.com/2014/11/27/world/asia/gunmen-in-pakistan-kill-4-members-of-anti-polio-campaign.html?_r=0

65 Bhutta, *supra* note 1, at 287.

66 *Id.*

67 INDEPENDENT MONITORING BOARD OF THE GLOBAL POLIO ERADICATION INITIATIVE, 1, 3 (Oct. 2013), *available at* http://www.polioeradication.org/Portals/0/Document/Aboutus/Governance/IMB/9IMBMeeting/9IMB_Report_EN.pdf [hereinafter INDEPENDENT MONITORING BOARD].

68 *Id.*

69 *Id.*

70 *Id.*

71 Animesh Roul, *The Pakistani Taliban's Campaign Against Polio Vaccination*, 7 CTC SENTINEL, 17, 17 (2014).

72 *Id.*

73 *See* Bhutta, *supra* note 1, at 286.

"spread to other parts of Pakistan that had previously been unexposed to the highly contagious virus."[74]

The Taliban have also been orchestrating an effective propaganda campaign, issuing several fatwas, or religious decrees, against the polio vaccination.[75] Since June 2012, militants have banned all polio health workers from FATA, primarily in retaliation for drone strikes.[76] In 2013, the Pakistan Taliban stated that "If they can convince us that these polio drops are Islamic and the spy agencies are not using it to kill our fighters, we would have no objection."[77] Other fatwas have also expressly declared that female workers are not allowed in Islam, and that the vaccines cannot be trusted because they are imported."[78] Since 2012, fatwas have tied the ban on polio vaccines to the U.S. led drone campaign in the tribal regions of Pakistan, stating that the vaccine campaign will not be allowed until the drone strikes end.[79]

B. Mismanagement

With a multitude of overlapping command structures, "multiple vertically run programs create inefficiencies, silos, and dysfunction."[80] Meddling by political figures in appointing vaccinators, 'ghost programs,' and a lack of accountability provide major hurdles in several programs.[81] According to the Polio Eradication Initiative, there are "micro-level management problems, a lack of transparency, and weak leadership in several key programs."[82] Despite public support given by the federal government, there is a "lack of provincial government commitment to rehab the public health infrastructure, as there is no provincial budgetary allocation."[83] The provincial and district level governments have shown a lack of commitment and a lack of accountability measures.[84]

In addition to the mismanagement at the planning level, the management and oversight of aid workers has also been ineffective. Polio workers in many parts of the country refuse to work and have often gone on strike due to lack of payments

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74 David Stout, *Militants Gun Down Pakistan Health Workers as Polio Crisis Intensifies*, TIME, Nov. 27, 2014, http://time.com/3608578/pakistan-polio-taliban-public-health/.

75 *See* Roul, *supra* note 71, at 18.

76 *See* Roberts, *supra* note 3, at 521.

77 *See* Roul, *supra* note 71, at 18 (explaining that the "us" refers to the Pakistani government, in their duty to adequately convince the Pakistani Taliban that the vaccine is strictly for medicinal purposes in treating polio).

78 *Id.*

79 *Id.*

80 *See* Owais, *supra* note 60, at 3317.

81 POLIO ERADICATION INITIATIVE, INDEPENDENT EVALUATION OF MAJOR BARRIERS TO INTERRUPTING POLIOVIRUS TRANSMISSION IN PAKISTAN, 1, 5 (2009), *available at* http://www.polioeradication.org/content/general/Polio_Evaluation_PAK.pdf [hereinafter POLIO ERADICATION INITIATIVE].

82 *Id.*

83 *Id.* at 25.

84 *See* Chang, *supra* note 12 at 6.

and inefficient security measures provided to them.[85] Many workers have affirmed the lack of payments, reduction in salaries, and runaway supervisors.[86] Absent aid workers, poor performance, and low morale was observed amongst vaccinators.[87] For aid workers, there is a lack of accountability in monitoring them, weak management structures, and insufficient incentives for polio aid workers.[88]

In addition, there are large discrepancies in salaries between national and local staff, and often local staff, working in dangerous environments, were not eligible for hazard payments.[89] About half of the number of workers envisioned for Pakistan's polio initiative are working, which is indicative of the lack of incentives provided to the aid workers.[90] Aid workers are often "under the threat of kidnappings, beatings, harassment, and even assassinations by militant groups."[91] Pens and ink that are given to aid workers that are used to mark the fingers of children that have been vaccinated are of low quality, and there are inadequate back-up power supplies to keep vaccines properly refrigerated.[92] There are also incomplete employment registration records, which are not computerized.[93] Further, in 2009, only 10% of aid working staff were female, mostly working at fixed station sites and not at the door to door campaign, where a female presence may be more beneficial.[94]

C. Misinformation

Although generally residents are aware of the campaigns, they are unaware about what exactly polio is have a lack of understanding of how vital polio vaccinations are.[95] Religious and political leaders in the tribal areas have publically denounced the vaccinations, describing them as a western conspiracy, aimed to cause infertility with the Muslim population.[96] There is generally widespread misinformation about the vaccines, described as a "western plot to curb birth rates in the Islamic world."[97]

The decision of the United States to use a fake hepatitis-B program in order to gather DNA samples and information to help kill Osama Bin Laden drastically eroded the public trust in the national polio drive, feeding into the prevailing

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[85] Zahir Shah Sherazi, *Polio Workers in Khyber Refuse to Vaccinate Children*, DAWN NEWS, (Oct. 20, 2014), http://www.dawn.com/news/1139173.

[86] *See* Khan, *supra* note 13, at 698.

[87] *See* POLIO ERADICATION INITIATIVE, *supra* note 81, at 25.

[88] *See* Owais, *supra* note 60, at 3317.

[89] *See* POLIO ERADICATION INITIATIVE, *supra* note 81, at 25.

[90] *See* Khan, *supra* note 16, at 698.

[91] *See* Chang, *supra* note 12, at 6.

[92] *See* POLIO ERADICATION INITIATIVE, *supra* note 81, at 26.

[93] *See* Owais, *supra* note 60, at 3317.

[94] *See* POLIO ERADICATION INITIATIVE, *supra* note 81, at 26.

[95] *Id.* at 25.

[96] *See* Chang, *supra* note 12, at 6.

[97] *See supra* note 13.

notion that vaccines were a deliberate plot by the Western world against Muslims.[98] Legitimate vaccinators were denied entry after the Bin Laden raid, often accused as being spies.[99]

V. Proposal

This section recommends four broad solutions to combating polio in Pakistan, including engaging with local Islamic leaders to provide access and education of the vaccine, borrowing strategies from India's successful anti-polio campaign, provide greater training and incentives to female vaccinators, and using technology to monitor and track polio-initiatives.

A. Engage with Local Islamic Leaders

Focus must be put on engaging and utilizing local religious leaders and institutions. Although prominent and international Islamic leaders have publically declared polio vaccines as permissible, the response from local leaders has been lukewarm.[100] In 2014, prominent organizations, including the Islamic Development Bank, the Organization of Islamic Cooperation, and the National Islamic Advisory Group of Pakistan issued a fatwa, stating that the polio vaccine is fully permissible under Islamic Sharia.[101] Vocal support from religious authorities was considered vital in ending the boycott in Nigeria, where local religious leaders became heavily involved in the campaign.[102] Before military campaigns by Pakistan in the area, Pakistan actively engaged Taliban shuras and ulemas, who issued fatwas allowing access to aid workers without any barriers.[103] Where access is not available, local Islamic organization can conduct the campaign with proper training.[104]

The government should negotiate for pauses in hostilities that allow for vaccinators to enter FATA.[105] Government leaders in Afghanistan negotiated with Mullah Omar, the former leader of the Afghani Taliban, to provide letters that allowed for vaccinators to access conflict areas in 2009, which proved to be extremely successful.[106] This strategy was also successful in Latin America, where

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98 Donald McNeil Jr., *CIA Vaccine Ruse May Have Harmed the War on Polio*, N. Y. TIMES (Jul. 9, 2012), http://www.nytimes.com/2012/07/10/health/cia-vaccine-ruse-in-pakistan-may-have-harmed-polio-fight.html?pagewanted=all.

99 *Id.*

100 *See* Bhutta, *supra* note 1, at 286.

101 INTERNATIONAL ULAMA CONFERENCE ON POLIO ERADICATION, ISLAMABAD DECLARATION/FATWA, *available at* http://www.endpolio.com.pk/images/reports/English-Declaration.pdf [hereinafter ISLAMABAD FATWA].

102 *See* Owais, *supra* note 60, at 3318.

103 *See* POLIO ERADICATION INITIATIVE, *supra* note 81, at 23.

104 *Id.* at 24.

105 *Id.* at 27.

106 *See* Chang, *supra* note 12, at 7.

warring factions agreed to 'days of peace' that allowed polio workers to conduct immunizations during authorized lulls in violence.[107]

There is also increasing evidence that augmenting the demand side of the vaccine can lead to better immunization rates, which can be achieved by the approval of local Muslim leaders.[108] These include providing educational messages, conditional cash payments, and tailoring the message to comply with Islamic principles.[109]

B. Engage with Local Islamic Leaders

Pakistan can turn to its neighbor in learning how to eradicate polio. Over three decades ago, India had over 250,000 registered polio cases.[110] However, by 2005, India was annually immunizing 170 million children twice each year.[111] In 2009, India reported over 700 polio cases, which was more than anywhere in the world – that number was reduced to just one in 2011.[112] Like Pakistan, polio cases were concentrated among children under two years of age, who resided in poor Muslim communities that were devoid of basic medical and sanitary services.[113] India's plan to combat polio included careful and meticulous planning and organization, revolving around careful micro-planning, strengthened accountability measures, a mass social mobilization, and an increase in human resources across all political levels.[114] Micro-plans were seen to be effective because they provided targeted data about each area.[115] Further, India's plan for eradication used effective communication strategies and an increase in the number of vaccinators.[116]

Perhaps India's most effective strategy in eradicating polio, however, was its holistic approach towards healthcare.[117] Community mobilizers, in educating parents about the vaccination program, also demonstrated the importance of "hand-washing, sanitation, exclusive breastfeeding, diarrhea management, and routing immunization.[118] Evidence suggests that India's mass media strategy,

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107 *See* Bhutta, *supra* note 1, at 286.

108 *See* Owais, *supra* note 60, at 3317.

109 *Id.*

110 *See Polio in Pakistan: Paralysis*, *supra* note 20.

111 *See* Obregon, *supra* note 26 (exploring the history of polio in India and Pakistan, the progress made by each country, and the lessons learned in eradication attempts in these countries).

112 Patralekha Chatterjee, *How India Managed to Defeat Polio*, BBC, (Jan. 13, 2014), http://www.bbc.com/news/world-asia-india-25709362.

113 *See* Obregon, *supra* note 26.

114 *See* STRATEGIC PLAN 2013, *supra* note 24, at 4 (examining Strategic Plan to eradicate polio, specifically the plans implemented in India).

115 *See* Chatterjee, *supra* note 112.

116 *See* Khan, *supra* note 16, at 699.

117 *See* Chatterjee, *supra* note 112.

118 *Id.*

which employed the use of famous sport stars and political figures, helped to quell any negative rumors about the vaccination.[119]

In 2010, India virtually became polio-free.[120] Despite its success, India does not plan to stop just yet. In 2014 and 2015, India plans six polio campaigns each year, where over two million workers will help to immunize over 170 million children.[121] This rigorous approach with extensive resources, if applied to Pakistan, would likely help make a dent in the spread of Polio in Pakistan.

C. Incentivize and Train Female Health Workers

Female health workers are also an extremely valuable asset. Where the husband is not present, Muslim homes can be inaccessible to men, and female workers, by gaining trust, can be responsible for "conducting tasks such as micro census, tracking population movements, and working with elders and parents."[122] Previously in Pakistan, the use of female health workers, familiar with the mothers, neighborhoods, and local language, were helpful to gain access to restricted households.[123] In addition, findings from the success of India's program "underlined the need to target women," particularly through "interpersonal communication by trained female health workers."[124] Hiring female workers from the local community in the past has made a noticeable difference.[125]

D. Use Technology to Monitor and Track Progress and Problem Areas

The use of technology can allow planners to target problem areas and keep track of children who have been vaccinated. Rotary International has begun to incorporate technology into its program, by distributing hundreds of cellphones to aid workers to circulate among the communities.[126] Information about missing children and homes that have been visited are uploaded onto a central spreadsheet, and aid workers also track pregnant mothers.[127]

Previously, Pakistan has successfully used technology to help track, monitor, and control another public health outbreak. When there was a dengue outbreak in the country, cell phones were given to workers to "take pictures, enter field activities, and take before and after pictures."[128] With the data that was collected, teams were able to focus on problem areas, and the cell phones provided a mech-

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119 *See* Obregon, *supra* note 26.

120 *See* Bhutta, *supra* note 1, at 285.

121 *See* Chatterjee, *supra* note 112.

122 *See* Chang, *supra* note 12, at 9.

123 *Id.* at 9.

124 *See* Obregon, *supra* note 26.

125 *See* Roberts, *supra* note 3, at 521.

126 Jeffrey Kluger, *The Battle to Eradicate Polio in Pakistan*, TIME, (Jul. 29, 2014), http://time.com/3051398/polio-pakistan-rotary/.

127 *Id.*

128 Beenish Ahmed, *How Smartphones Became Vital Tools Against Dengue in Pakistan*, NPR, (Sept. 16, 2013), http://www.npr.org/blogs/health/2013/09/16/223051694/how-smartphones-became-vital-tool-against-dengue-in-pakistan.

anism to audit and track workers.[129] However, the use of technology would only be effective if properly managed, as "technical innovation cannot overcome gaps in program management and community engagement."[130]

VI. Conclusion

Both Pakistan and the world became painstakingly close in eradicating the polio virus in 2010. With the help of the Global Polio Eradication Initiative, Pakistan saw a drastic decrease in the level of polio cases up through 2008. However, a perfect storm of variables have conspired in making Pakistan the global epicenter of the reemergence of the polio virus. There has already been a spread of the Pakistani variation of the virus to neighboring countries and beyond, and if not controlled quickly, the virus can quickly become uncontainable.

The reemergence of Polio in Pakistan has been attributed to a multitude of core reasons. First, polio initiatives in Pakistan have been ineffectively managed, with lackluster support through all levels of government, insufficient incentives and protection for aid workers, and an overlap of goals and resources. Second, the worsening security situation has effectively made FATA a no-entry zone for aid workers. Third, the rise of misinformation about the vaccine, exacerbated by the exposure of the fake hepatitis-B drive, has decreased the demand-side for the vaccine.

In order to reverse the trend of the increase of polio cases in Pakistan, health officials must engage in a multi-prong approach. First, the initiative should utilize local Islamic community leaders, as their support is essential in both allowing aid workers to enter areas controlled by Islamic militants, and to help stop the spread of misinformation about the vaccine. Second, by following in India's path, and by focusing on a holistic approach by offering a multitude of health services during an anti-polio initiative, aid workers can better communicate the message of the importance of the vaccines. Third, funding must be allocated to improve incentives and training of female health workers, who are in a position to better implement anti-polio initiatives at a grass-roots level.

The reemergence of polio in Pakistan has not gotten out of control yet. However, if steps are not taken quickly, the spread of polio from the tribal regions to urban centers like Karachi, where there are already reports of new outbreaks, can lead to a new global public health crisis.

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129 *Id.*

130 *See* WORLD HEALTH ORG., *supra* note 24, at 4.