

The Global Polio Eradication Initiative (GPEI) in Pakistan

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Abstract

The Global Polio Eradication Initiative (GPEI) has significantly reduced the worldwide incidence of poliomyelitis. However, polio remains endemic in Pakistan which poses a threat to the success of the GPEI. Issues faced by Pakistan relate to politics, terrorism, war, natural disasters, funding constraints, misconceptions and inadequate infrastructure. These contribute in hampering the aims of the GPEI and allow the deadly poliovirus to maintain its reservoir in Pakistan. Until polio is completely eradicated, all countries remain at risk of its re-emergence and this is of grave concern as potentially it could reverse the polio-free certified status of a whole World Health Organisation (WHO) region. With the increase in global travel and international migration, even the smallest potential risk should not be taken lightly. Recommendations are made to help to improve the state of polio in Pakistan to make full use of the GPEI investment and move towards a polio-free world.

Keywords: Poliomyelitis, Polio, Eradication, Vaccination, Vaccine.

Introduction

The Global Polio Eradication Initiative (GPEI) launched in 1988 has significantly decreased the worldwide incidence of poliomyelitis (polio). At the time of writing in 2015, there are two remaining countries with endemic polio (Pakistan and Afghanistan). Nigeria, which was the third endemic country, has been polio-free since July 2014.¹ The extraordinary success of the GPEI has motivated the global community to completely eradicate polio from the remaining two endemic countries.

The World Health Organisation (WHO) declared polio eradication as a public health emergency of international concern and in November 2012, the Polio Eradication and Endgame Strategic Plan for 2013-2018 (referred to in this paper as Endgame plan) was setup, aiming to make history by creating a polio-free world. One of the targets (objective 1) of the GPEI Endgame plan was to stop all

wild-type poliovirus transmission by the end of 2014 and this target was not achieved.²

On the whole, polio is a distant memory, however, remains a huge problem in Pakistan. This paper will discuss the problems faced by Pakistan in their fight against polio and the many reasons why objective 1 of the Endgame plan was not achieved in Pakistan. Recommendations will be made based on an analysis of the specific hurdles faced by Pakistan.

Poliomyelitis

Poliomyelitis became a major public health problem in late Victorian times when there were epidemics in the United States of America and Europe. Significant progress in polio eradication has resulted in 80% of the world's population now living in WHO regions which are certified as being polio-free³ and 10 million people are able to walk today who would not be able to without the polio vaccine.² Although there are 3 types of poliovirus, namely wild poliovirus type 1, 2 and 3, types 2 and 3 have been eradicated and were last reported in 1999 and 2012 respectively.⁴ All 416 cases of wild poliovirus in 2013 were caused by type 1 poliovirus⁵ which is the most neurovirulent of the three wild poliovirus strains.⁶

Poliomyelitis is a highly infectious, preventable viral disease that multiplies in the intestine and causes many non-specific symptoms and irreversible paralysis caused by spread to the nervous system. In the worst cases, polio can cause death. The virus is transmitted faeco-orally or via the oral-oral route and in rare cases, it can also spread through water or milk. It is thought that the faeco-oral route is predominant in the global south (developing countries) because of poor sanitation whereas in the global north (developed countries), oral-oral spread is more likely.⁷

There are currently two types of polio vaccines: Oral Polio Vaccine (OPV) and Inactivated Polio Vaccine (IPV). The newer IPV vaccine is more expensive and complex to administer as it requires injections compared with OPV which is administered as oral drops. OPV is used in most of the global south because it is cheaper, easier to administer and it induces a higher level of intestinal immunity to minimise faeco-oral spread than IPV. OPV is

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also less effective than IPV in developing countries, the reasons for this are multi-factorial including malnutrition which has been found to contribute to a poor immune response to OPV.⁸

Another problem with the OPV is that they can cause vaccine derived poliovirus (VDPV) which are genetically mutated strains and although VDPV confers both the neuro-virulence and transmissibility of wild poliovirus, the small risk of VDPVs pales in significance to the tremendous public health benefits of the OPV.⁹

The Global Polio Eradication Initiative (GPEI)

The GPEI was developed in collaboration with many organisations including United Nations International Emergency Children's Fund (UNICEF), United States Centres for Disease Control and Prevention as well as national governments. All 194 member states of the WHO work under the GPEI and all 6 WHO regions strive to achieve certification of being polio-free. So far, 4 of the 6 WHO regions have been certified as being polio-free and the remaining regions to achieve certification are Africa (Nigeria) and Eastern Mediterranean regions (Pakistan and Afghanistan). If Nigeria continues to remain polio-free, it will achieve certification in 2017.¹

Funding is fundamental to the GPEI's success and polio infected countries and other organisations have made huge financial pledges to achieve the GPEI's aims. It has been estimated that the cost of the GPEI Endgame plan is US \$5.5 billion; however, the potential saving is estimated to be US \$40-50 billion.¹⁰ Polio eradication not only benefits the health of individuals but also minimises burden on healthcare systems by removing the cost of polio associated morbidity. Having eradicated polio, the intensive and expensive polio campaigns could also be stopped. Therefore from an economic perspective, the GPEI's plans are justified. Costs of the GPEI plan includes the cost of campaigns, IPV, surveillance, laboratory assistance and human personnel who form the largest single source of external technical assistance for immunisation and surveillance in low-income countries.¹¹

An important part of the GPEI's success involves having the right checks in place to ensure that milestones are met and any problems are identified early so that corrective actions can be implemented. The World Health Assembly (WHA), which is made up of all member states of the WHO, provides the overall governance of the GPEI and organisations including the Independent Monitoring Board (IMB), Strategic Advisory Group of Experts (SAGE) and the Polio Oversight Board (POB) are also involved in monitoring and advising the GPEI. These organisations work together to regularly advise and monitor the

progress of the GPEI.

The Global Polio Eradication Initiative (GPEI) and Polio in Pakistan

Pakistan appeared to be on the brink of success in the battle against polio in 2012 when 58 cases of polio were reported compared with 198 cases in 2011.¹² However, the momentum of success was not maintained as 174 cases of polio were reported in 2014¹³ and Pakistan alone accounts for 86% of the total number of polio cases reported worldwide.⁷ Interestingly, whilst polio has decreased seven-fold in the rest of the world,¹³ the virus is flourishing in Pakistan which has shown an increase in the number of polio cases by 60.3% in 2013.⁷ These astonishing figures are deeply concerning and warrant investigation, exploration and analysis of why this is the case.

Pakistan's polio programme has been described as 'a disaster...the principal victims are the children of Pakistan'.¹³ Pakistan is failing to protect their vulnerable children who deserve much better. In 2010, the Pakistan Institute of Legislative Development and Transparency (PILDAT), deemed children to be the most neglected part of Pakistan¹⁴ which has a population of 182.1 million.¹⁵ As children under 14 years of age form 33.8% of the population, it is crucially important that matters related to them are given the utmost priority.¹⁶

The virus in Pakistan is out of control and in 2014, four fifths of people paralysed by polio worldwide were in Pakistan.¹³ Such distressing statistics raise the question of why and how Pakistan has become the modern-day polio hotspot. Something has gone terribly wrong and Pakistan has been unable to improve or even maintain the lower polio levels they had achieved in 2012. Pakistan has faced a number of difficulties in recent years including natural disasters, terrorist attacks and war in neighbouring countries.¹² As well as these unfortunate and tragic events, bribery, corruption and other malpractices at institutional and governmental level have hindered their progress and further augmented the challenge against polio.⁹

Contributing factors including natural disasters have caused major disruption in infrastructure and sanitation as well as disturbed transport systems and an inaccessibility of vaccinations.¹² Poor vaccine quality caused by disruption of the cold chain as a consequence of power outages are also a causative factor in allowing the poliovirus to flourish and make a home in Pakistan. Terrorism and difficulties reaching children in politically unstable areas have also played a huge role as well as

misconceptions regarding the polio vaccination programme.⁹

Threats faced by Pakistan in their attempt to eradicate polio include the targeted killing of polio workers in 2012 and 2013 which resulted in the death of 22 polio workers, 4 police officers and injury to numerous others.¹⁷ Since the first attacks on polio workers in 2012, more than 70 healthcare workers and those protecting them have been killed.¹⁸ As well as spreading terror and fear, such attacks undermine the concerted efforts made by polio workers who fear going to some areas of Pakistan because of previous attacks on their colleagues.⁹ Not only do these attacks discourage polio workers to continue working for this cause, they also make parents unwilling to take their children to health centres to be vaccinated. In essence, terror attacks instil fear in the hearts and minds of all members of the community and the fact is that such fears are not unreal or imagined; sadly they are true and enduring. Effective leadership has been lacking in Pakistan in recent years and this has also impacted negatively on the GPEI.¹³ Security risks in Pakistan pose a continuing threat to the GPEI's aim of achieving a polio-free world and research suggests that this may be the most challenging issue to overcome.¹⁹

It should be remembered that health is pivotal in maintaining individual human security and 'health is a central aspect of wellbeing and human dignity and should never be manipulated to achieve non-health purposes'.²⁰ An example of a departure from this understanding is the ban which was placed on polio vaccination in 2012 in North Waziristan. This left a quarter of a million children unvaccinated¹³ and contributed significantly to the increase in polio in Pakistan. Polio immunisation efforts were banned and polio workers were targeted in attacks because of rumours and suspicions propagated by some groups claiming that the polio vaccination drive is part of a Western espionage plot²¹ and a conspiracy to sterilise their children.²² These have led to some decline in public confidence in polio vaccination programmes.

This ban is claimed to have been in response to the use of false vaccination campaigns in the search for Osama Bin Laden. It promoted mistrust among tribal populations and triggered the terrorist attacks against polio workers. It left Pakistan hopelessly floundering until 19 June 2014 when the Pakistan army undertook a major operation (Operation Zarb-e-Azb) and took control of North Waziristan. Almost all families fled the area and this clear out of North Waziristan has been described as 'a double-edged sword' as unvaccinated children left North

Waziristan taking the virus with them and dispersing it over a larger area.¹³ Polio was no longer contained in this inaccessible pocket in North Waziristan and this problem was faced head-on by the Pakistani government and unvaccinated children were vaccinated at temporary transit points. In this way, this window of opportunity was regarded as gold dust and availed to minimise further spread of polio.

An interesting link between health and national security has been highlighted and provides a broader perspective. Spread of infections across international borders is a concern for the global community as it presents a risk to a country's national security by placing its citizens' and residents' health at risk.²⁰ Population displacement and migration allow infections to cross borders and Pakistan's polio virus has paralysed 38 children in Syria and Iraq.¹³ Polio is also endemic in neighbouring Afghanistan and spread from Pakistan further contributes to this. Polio in neighbouring Afghanistan is closely entwined with Pakistan and eradication is unlikely to be achieved independently in any of these countries. As the majority of each country's polio cases have been near the borders of both countries,¹ they should be viewed as one regional block acting as a reservoir of the polio virus. Pakistan poses a continuing risk to the international community and special efforts are required by all countries. Former United States Secretary of State, Hillary Clinton 'urged major increases in resources for global health'²⁰ and the fight to end polio is not just Pakistan's problem, neither is it only the problem of Pakistan's neighbouring countries. Border between Pakistan and Afghanistan has been described as 'a long porous border' with large-scale population movement and although there are vaccination posts in place, many children cross the border in both directions without passing through these posts.²³ Both of these countries must continue to collaborate, coordinate and utilise their resources effectively to interrupt the circulation of polio between them.

Fearing further spread of polio and its consequent re-emergence in polio-free areas, for the second time in its history, the WHO declared the threat of spread of polio to be an international emergency because it risks the wellbeing of all.⁴ The IMB has highlighted that countries which are very distant to the endemic polio countries are at high risk of re-emergence of polio, for example, Ukraine.¹³ This is of grave concern as potentially it could reverse the polio-free certified status of a whole WHO region, namely Europe. Ukraine is at particular risk given the recent conflict there, the weak polio surveillance system, reduced vaccination coverage and extreme vaccine shortages.^{13,24} Therefore, it is in the best interests

of all nations worldwide to support and assist Pakistan to eradicate polio from their country.

As well as the political unrest, security and inaccessibility issues, other factors contribute to the dwindling vaccination rates in Pakistan which have ultimately caused decreased immunity and increased polio rates. These other factors are equally important and impact on those children who live in parts of the country which are less crippled by political and security issues. Research by Sheikh A. et al. in 2013 suggests that lack of knowledge and religious taboos are the most common factors contributing to non-vaccination of children in Pakistan.²⁵ This study was conducted at tertiary centres in Pakistan and only included parents whose children were more than least 2 years old. This questions the generalisability of the results as the majority of children's vaccinations are administered before the age of 2 years. Children in smaller towns and villages who are least likely to be vaccinated are also least likely to attend tertiary centres because of their locations in bigger cities as well as the associated cost of visiting such institutions. However, it does raise important issues and suggests that there is a dire need for mass campaigns to promote awareness in collaboration with major religious organisations.²⁵ It raises the issue of the impact of religious and cultural beliefs on individual's health perception and decision making. Participants in this study held various beliefs including that the Imam (religious leader) had forbidden the use of vaccines because they contain porcine components and that vaccination is a conspiracy of the Zionists and causes infertility.²⁵ In an attempt to dispel such beliefs, in February 2014, the Global Islamic Advisory Group for Polio Eradication declared 'the importance of Islamic solidarity in combating polio...and acknowledge that it fully conforms to Islamic principles and religious rulings'.²⁶ Authorities in Pakistan have also hired religious leaders to convince parents individually once their refusal has been identified.

It is not all doom and gloom in Pakistan and the country is full of aspiring hardworking individuals who are keen to improve the state of their beloved country. However it is also clear that Pakistan is potentially jeopardising the GPEI's strategy to end polio for good. In general, Pakistan is taking polio seriously and perhaps has even implemented some extreme measures to increase their uptake of the polio vaccine. In Khyber-Pakhtunkhwa, 471 parents were arrested under Section 3 of the Maintenance of Public Order for refusing vaccination and warrants to arrest another 1,000 parents were also issued.²⁷ Such extreme measures to force parents to vaccinate their children have been taken to rid polio as it 'is putting

Pakistan's image at stake around the globe'.²⁷

Having considered the contributory factors which have led to the failure of objective 1 of the GPEI Endgame plan being achieved in Pakistan, this paper will now go on to make recommendations for the future as well as highlighting key learning points from neighbouring India which has successfully eradicated polio.

Recommendations

In their 2014 report, the IMB recommended that the Prime Minister and Cabinet of Pakistan order the National Disaster Management Authority to lead the polio eradication efforts as they are in prime position to enlist the support of political leaders, officials and the military to take on the task of eradicating polio.¹³ This will help enlist the high level of governmental engagement and financial commitment that is lacking in Pakistan. There have been suggestions that funds that are being spent on polio eradication should be directed towards the strengthening of immunisations in general.²⁸ However, it would take years to improve the immunisation infrastructure to a sufficient extent and in the meantime many children would suffer incredibly. There would also be potential resurgence of polio in countries declared polio-free which would be disastrous as the multiple billions of US dollars already spent by the GPEI would be a waste. No doubt polio eradication is expensive but these high upfront costs will decrease once polio has been successfully eradicated and then there will remain the cost of maintaining uptake of the polio vaccine. The potential costs saved by the avoidance of polio outbreaks should also be remembered.

Committed political will and interest have a significant role to play not only in terms of providing funding but also in encouraging the masses to participate in polio vaccination programmes. Campaigns to promote awareness and improve knowledge should be specifically tailored as one size does not fit all and tactics and approaches must be specific to the needs of those they are aimed at.² High illiteracy rates combined with fake propaganda campaigns against vaccinations have permitted the exploitation of many innocent people who are already at a grave disadvantage. Campaigns utilising newspapers will inherently be defective for the large proportion of Pakistani society who are illiterate and will therefore not achieve their purpose. This would not be the best use of the limited resources available to a country crippled by corruption and political instability.

Raising awareness and increasing knowledge of the polio vaccine is insufficient to eradicate polio. In countries like Pakistan where there is high population density and poor

sanitation, attempts should also be made to improve the basic infrastructure and living conditions which contribute to the spread of infection. In this way, the spread of polio can be minimised.

All countries remain at risk of the reintroduction of polio as a result of migration and international travel and suggestions have been made to introduce compulsory polio vaccination for travellers from endemic countries. Travellers would be required to present an international certificate of vaccination as evidence. However, these recommendations are not being implemented fully as most countries are not checking for these certificates on the passenger's arrival into the country.¹³

Although the problems faced by two countries are never exactly the same, there is much insight that Pakistan can gain from neighbouring India. The factors behind India's remarkable success will be highlighted to identify key learning points for Pakistan. India was described as 'the most technically challenging place to eliminate polio'² and the obstacles faced by India 'were thought to be insurmountable'.²⁹ However, in February 2012 India celebrated one full year without having a child paralysed by polio.

One important contributing factor to India's success was the launch of the National Polio Surveillance Project (NPSP) by the Indian government. This formed a system of close and continual monitoring of polio as well as a rapid response to cases of polio. Lessons from India include the implementation of micro-planning, strengthened monitoring and strict accountability as well as an increase in human resources and staffing at both the district and sub-district level.² The success in India may seem like a fairy tale but is a testimony of people's sheer hard work, cooperation and collaboration which has left a legacy of their achievement and makes India a role model for other countries striving to eradicate polio.

Engaging the help and support of influential and high-profile people including religious leaders is also beneficial in reaching out to the masses and encouraging the community to vaccinate their children. The resulting increase in community demand for vaccines places a duty on the state to fulfil their citizen's lawful demands. As well as the use of influential people, technology should also be used to promote awareness. In this way, social media websites should be used in the future and although this method will only access a sub-group of the population, in combination with other methods will prove effective. As research forms the bedrock for the future, further research into polio and the impact of the programme as well as reasons for non-vaccination should be encouraged and

funded.

Having early warning systems in place for the timely detection of virus presence or spread would also be beneficial, for example, by routine sewage testing for the poliovirus.⁷ It is important to improve the clinical detection of potential cases of polio and encourage healthcare professionals to consider polio as a differential diagnosis in children presenting with its features. It is also important to ensure that high-quality vaccinators are trained and supervised as well as the independent monitoring of their performance to ensure that the highest quality healthcare is provided.

Progress made by the GPEI should be used as a 'blueprint' to responsibly transfer the expertise and infrastructure gained from polio eradication campaigns to benefit other health initiatives. In this way, GPEI should continue to reach the marginalised hard-to-reach children worldwide and disseminate healthcare interventions including other vaccinations, anti-malarial bed-nets, and anti-helminthic medicines (deworming pills). All of these will help to improve the lives of children globally whilst making full use of the GPEI investment.

Conclusion

Pakistan poses a threat to the success of the GPEI and until polio is completely eradicated, all countries remain at risk from polio. In a country with compromised national security, inaccessibility, political issues and funding constraints form great challenges allowing the deadly poliovirus to maintain its reservoir in Pakistan. This paper highlights the issues faced by Pakistan and identifies strategies to overcome these. These strategies will improve the general health infrastructure and requires micro-planning and intensive communication. Enhanced efforts by religious, governmental and humanitarian agencies are also required and in this way, the decades of effort and funding by the GPEI will not be wasted as we move towards to a polio-free world.

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