

## POLIO ERADICATION: CURRENT STATUS AND CHALLENGES IN PAKISTAN

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### ABSTRACT

*Poliomyelitis (Polio) is a debilitating illness and a preventable cause of mortality and morbidity. It affects mainly children and can be prevented by the proper use of vaccine. Global Polio Eradication Initiative was successful in eradicating this deadly illness globally except in three countries i.e. Afghanistan, Pakistan and Nigeria. A literature review was carried out to identify available studies relating to socioeconomic obstacles in eradication of polio in Pakistan. "Pubmed", "Science Direct", "Google Scholar" and "Cochrane Library", were the search engines utilized to review the literature. Present study discusses facts about socioeconomic barriers related to poor or failed vaccination among children in Pakistan against Polio. We suggest to raise basic awareness in people regarding polio vaccination and defensive approaches to overcome the major factors responsible for non-vaccination of children in Pakistan.*

### Keywords:

*Polio, Polio and Pakistan, PEI (Polio Eradication Initiative), WHO and Polio, Polio cases, Polio Endemic Countries*

### INTRODUCTION

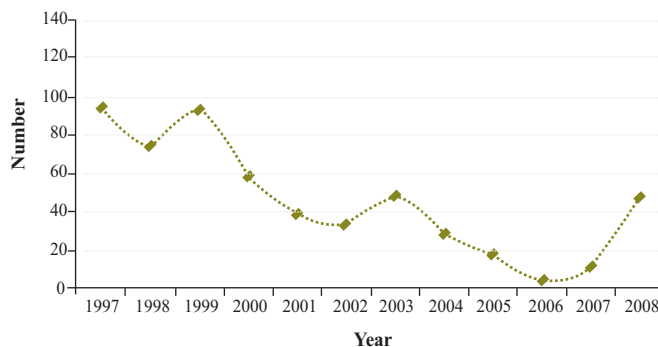
Polio is a disabling contagious infection spreading through Polio Virus that invades nervous system and causes muscle paralysis. Poor sanitary conditions lead to food and water contamination and spread of the disease.<sup>1</sup> Polio affects mainly children under five years of age. There is no cure available yet but disease can be controlled via vaccination. The vaccine has different subtypes, the first being the very famous "Salk Vaccine", discovered by Dr. Jonas Salk in 1955, which is an inactivated poliovirus vaccine. Others include Oral Polio Vaccine (OPV), OPVs can be, Monovalent (mOPV), Bivalent (bOPV) or Trivalent vaccine (tOPV).

### HISTORY

Poliomyelitis (Polio) has been present in New York since several decades, with the first major outbreak in 1916. Owing to the deep fear of this disease, the epidemic prevented public meetings at that time.<sup>2</sup>

In 1988, Polio Eradication Initiative (PEI) was launched by WHO. Polio virus infects more than 350,000 individuals in 125 endemic states.<sup>3</sup> The effectiveness of

this effort is evident by the fact that in 1994, WHO region of Americas was reported as polio-free followed by the WHO region of West Pacific in 2000 and WHO region of European in 2002.<sup>4</sup> Unfortunately Afghanistan, Pakistan and Nigeria are still fighting against this infectious disease.



**Figure 1: Number of districts with confirmed cases of polio in Pakistan, 1997-2008**

In 1994, PEI was launched in Pakistan.<sup>5</sup> Initially, the outcome of this initiative was quite effective, with the number of cases falling from 1155 in 1997 to 28 in 2005.<sup>6</sup> However, from 2007 onwards; the number of polio cases started to rise; about 128 in 2011 and 306 in 2014. The number reduced to eight cases in 2017 with a rise again in 2019 to 144 cases. The number of cases had already reached seventeen in March 2020. The factors responsible for this resurgence are multiple and

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multifocal. The main aim of this article is to focus on these hindrances that has led to failure of polio eradication in Pakistan and provide recommendations to overcome it.

The chart below shows the number of polio cases among different provinces of Pakistan from 2015 to 2020.

**Table I: Wild polio cases across provinces of Pakistan**

Province	2015	2016	2017	2018	2019	2020
Punjab	2	0	1	0	10	0
Sindh	12	8	2	1	30	5
KPK	33	10	1	8	92	10
Balochistan	7	2	3	3	12	2
Gilgit	0	0	1	0	0	0
AJK	0	0	0	0	0	0
Total	54	20	8	12	144	17

Source: (National Emergency Operation Centre)<sup>5</sup>

## METHODOLOGY

Articles were searched using search engines of “Pub med”, “Google scholar”, “Science direct”, and “Cochrane library” by employing the terms “Polio”, “Polio and Pakistan”, “WHO and Polio”, “Polio Eradication Initiative (PEI)”, “PEI and Pakistan”. In order to find articles related to targeted study, the reference list of selected articles was systematically reviewed. During the exploration, no time limit was imposed. A total of thirteen articles were selected after carefully reviewing and two of them were excluded. All search results, including published original articles and English-language reviews, are considered.

## LACK OF VACCINATION

After thorough literature review, the core reason of the persistence in polio cases was the failure of vaccination which is mainly due to incomplete vaccination or complete lack of vaccination. In Pakistan, there is approximately 75% coverage of vaccination done in year 2011<sup>7</sup> whereas, there were 33.1 million children who were vaccinated in year 2013 and about 2.34 million cases were considered as missing. In year 2014, WHO-UNICEF survey revealed that there is about 66% of immunization coverage across country.<sup>8</sup> The similar statistics were observed in a study conducted in Peshawar showing that there is about 64.2% children from both rural and urban areas who were fully immunized.<sup>9</sup> Since year 2000, Pakistan has initiated the efforts regarding the polio supplementary immunization activities (SIAs). For this, an idea of door to door home delivery of vaccination has been initiated because the

situation was so alarming that it is in fact threatening the global polio eradication efforts.<sup>10</sup>

## FACTORS AFFECTING PARTIAL VACCINATION

In Pakistan, there were many factors identified as obstacles in completion of vaccination. These factors have been classified into three major categories i.e factors which are mainly associated with population demographics, factors which are pertaining to the knowledge of caretaker and factors which are related to organization and implementation of mass campaign.<sup>11</sup>

### a. Socioeconomic factors

The success of the immunization programs depends mainly on the socioeconomic factors. Similar outcomes were noticed by Mohammad A. (2014), in a case-control study. He found out that poor knowledge about vaccination and illiteracy of the heads of the family, were the major factors<sup>12</sup>. Poverty, unawareness and illiteracy lead to a vicious circle responsible for non-vaccination in nearly all the endemic areas<sup>13</sup>. A cross-sectional study done by Mohammad K. (2012), in Peshawar, depicted a range of detrimental socioeconomic factors including low educational status of parents, taking vaccination as an unnecessary activity, religious as well as cultural beliefs and social norms<sup>14</sup>.

### b. Illiteracy of caretakers

Although father’s education and employment played an imperative function but mother’s education seemed mandatory in this regard<sup>15</sup>.

### c. Lack of resources

A study conducted in Sub-Saharan Africa showed that vaccination coverage was clearly affected by mass media campaigns<sup>16</sup>. Similar results were found in a study from Ethiopia that unavailability of mass media was a factor responsible for non-vaccination of children in rural areas<sup>17</sup>. Long distances of the polio vaccination sites from the houses, unawareness about the campaigns and poor availability of mass media were the factors depicted in a survey in rural areas of Pakistan.

## CONCLUSION

Poliomyelitis, a disease that leads to morbidity and preventable mortality in children, is still endemic in Pakistan. The world cannot be declared polio free until a single case of polio is present in any part of the globe. Pakistan, unfortunately, is harboring the major burden of the disease and although reasons of this persistence are multifocal, the major one is the socioeconomic factors.

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In order to overcome these factors, a joint approach of the government and community is required. Local community centers and health centers could be a great source of knowledge and education of parents especially mothers regarding proper vaccination.

WHO facts showed that more than 18 million people are able to walk today who would have been paralyzed otherwise. Around 1.5 million childhood deaths have been prevented since, through the systematic administration of immunization.

The literature review above suggests that there is a wide gap in knowledge from the quantitative synthesis of evidence regarding the responsible factors to persistence of polio in Pakistan. Although a fair amount of data is there in the form of qualitative or mixed- method studies but the number of prospective studies is limited. So, it is significant that further detailed studies and focal group discussion should be conducted in this field as well.

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