SHORT COMMUNICATION

Polio Vaccination Challenges in Karachi: Bridging the Gap between Awareness and Action

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Abstract

In this short communication, the limitations to polio vaccination in Karachi, Pakistan, are explored and discussed, with recent data presented. Poliovirus continues to circulate in Karachi due to multiple challenges that affect vaccination coverage among affected populations. This paper provides a brief discussion of socio-cultural factors influencing vaccine uptake, logistics, politics, and information based on a review of recent studies on Pakistan and other LMICs, along with possible solutions.

Keywords: *Polio, vaccination, challenges, awareness and action, Karachi, action.*

INTRODUCTION

Present challenges exist even though polio has been targeted to be eradicated both nationally and internationally in Pakistan, especially in Karachi. According to the World Health Organization, Pakistan is still on the list of two countries with wild Poliovirus, a situation that demands better vaccination services [1]. Similarly, Karachi has a large, inflexible pool of viruses with detectable transmission across different settings, as indicated by environmental surveillance data from previous years [2]. This review considers important factors hindering vaccination in Karachi, drawing on findings from Pakistan and other Low- and middle-income countries (LMICs) to identify the necessary strategies.

Unfortunately, Sindh also reported 13 cases in 2024, of which 04 were from Karachi's different districts [3]. Faecal contamination in Karachi's water supply has been detected in the city's sewage, thereby confirming the ongoing circulation of the poliovirus, which threatens efforts to stop the disease and poses a high risk to other areas as well [4]. These findings suggest the need to continue interventions in these or similar areas of high incidence.

BARRIERS IN POLIO ERADICATION

Social Factors

Knowledge of vaccines is skewed, and this has bred resistance in various communities. The recent study also highlighted mistrust, specifically regarding the safety and necessity of the vaccine, the motives behind repetitive campaigns, and certain implementing bodies, especially among low-income families in Karachi, which concerns vaccine side effects and political motives [5].

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The religious misconceptions that influence perceptions of vaccination have been reported as a key issue in Karachi: a lack of awareness about immunization. Several low- and middle-income countries (LMICs) have reported vaccine program resistance, specifically in religiously conservative regions, but scholarship has been primarily focused on resistance in other LMICs. Community engagement should be sustained, continuous, and community-led to address community fears about accepting the oral polio vaccine (OPV) that have been repeatedly expressed during campaigns. Such efforts work best when organized and spearheaded by reputable local figures so that the participation is not limited to campaigns but carried out in the long run.

Political Factors

Political agendas that change with time make it hard to sustain the needed vaccination programs. A new policy and leadership discourage campaign planning and reduce the emphasis on resource use [6]. Poor governance and instability pose a challenge to coordinated response, and security issues in some regions have led health teams to stop functioning or reduce the scope of operations.

Religious Factors

It is common for misinformation, such as rumors that the polio vaccine has side effects impacting fertility or is generally toxic, to be circulated in areas that are characterized by low levels of trust. This is not only counterproductive to vaccination but also to any future public health measures that people will be presented with [7]. With religious leaders, their ability to spread myths or eliminate them can be pivotal to the fight, and their participation as allies has helped mitigate resistance.

Social Mobilization

This type of health education, using local language, culturally sensitive methods, and involving competent

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personalities, is more effective. However, the scarcity of such resources and the minimal investment in such targeted awareness campaigns in Karachi have prevented their complete popularization. The intervention during the improvement of vaccine coverage, involving the use of mobile health units associated with local community workshops within the framework of culturally acceptable media interventions, is also considered to be ahead of its time [8]. Open communication and regular presence in the community are required to establish trust in the vaccine and those who administer it.

IMPROVED MONITORING SYSTEMS

A better data framework, by adopting digital technologies and advanced surveillance methods, and by enabling exact reporting, can improve surveillance quality and speed response [9]. New technologies, such as Android-based tablets and phones, which allow the health worker to enter the vaccination data directly at the field level, and subsequent web-based central databases which are readable by both sub-national and national health officials, can facilitate an improved way of obtaining the coverage information and quick detection of new, frequent polio cases. Second, by adding vaccination data to a GIS, it is possible to create maps showing areas of high risk and update them dynamically. This kind of system prevents missing an area and enables one to respond to real-time data specifically. The polio eradication program requires complete data and reporting to pinpoint appropriate targets for program initiatives and allocate resources effectively [10].

CURRENT SITUATION & ECONOMIC FACTORS

There were 48 confirmed WPV1 Polio cases in Pakistan in 2024. Sindh reported 13 cases, of which 04 were confirmed in Karachi, 02 in Karachi Kemari, 01 in Karachi East, and 01 in Karachi Malir. Successive vaccination programs in Karachi continue to face challenges. Elevating vaccination acceptance requires implementing a comprehensive approach to address the obstacles that stand in the way of population acceptance.

Lack of access, as well as poverty, prevents many families from participating in vaccination campaigns, especially those living in remote areas, such as informal settlements. The eradication, with its employees' education, transportation, and surveillance technologies, is expensive, which continually impacts the programs' budgets. Also, the cost of polio to the economy, in terms of lost output, rising healthcare expenses, and burdens that place additional demands on limited public health system resources, serves to perpetuate the cycle in which the disease is both cause and result of economic deprivation.

CONCLUSION

Efforts to eliminate polio in Karachi need implementation strategies that confirm communities' changes in health behaviours, increase access to health facilities, and reduce security risks in the province. The dissertation presents that further enhancing community engagement, better resource coordination, and ongoing environmental monitoring of poliovirus are critical to maintaining the vaccination advances made in Karachi and stopping poliovirus circulation.

RECOMMENDATIONS

Religious and community leaders can be involved in vaccination efforts to reduce the impact of misinformation. There is a need to enhance security features, strengthen local governance, and intensify security measures to sustain the campaign uninterrupted. Transportation and training of other staff can increase outreach in the areas that are not well served. Education strengthened by targeted campaigns that tackle myths specific to the population and raise awareness of the benefits of vaccination will help.

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CONFLICT OF INTEREST

The authors declare no conflict of interest.

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AUTHORS' CONTRIBUTION

Sameera Ali Rizvi: Conceptualization

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GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work the author(s) limitedly used ChatGPT (GPT-4, OpenAI) to get language suggestions and do minor proofreading in some parts of the manuscript. After using this tool/ service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the published article.

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