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COMMENTARY

# Polio vaccine misinformation on social media: turning point in the fight against polio eradication in Pakistan

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**ABSTRACT**

Pakistan's polio eradication program faces immense challenges, including misinformation on social media that resulted in an increased number of new polio cases in 2019, when viral misleading videos were shared online. In recent years, misinformation has played a critical role in shifting the public's attitude on polio vaccination acceptance in Pakistan. Vaccine misinformation on social media marked a turning point in information consumption habits of Pakistanis and the content moderation policies of social media platforms, as well as the relationship between the government of Pakistan and tech giants like Facebook, Google, and Twitter. This commentary suggests that instead of relying on national-level information, Pakistan's provincial and local health departments should engage with local users on social media to correct vaccine misinformation about polio. Further, vaccine communication must acknowledge the existing information gaps, and take into account readers' and viewers' concerns. To mitigate the amount and spread of visual content related to vaccine misinformation, monitoring visual misinformation more closely, perhaps using the AI capabilities of Google's DeepMind, would be helpful.

## Background and context

Polio is still endemic in Pakistan and it continues to pose serious threats to public health in the country.[1,2] However, recently, the Polio Eradication Initiative has faced unique challenges and difficulties to eliminate polio from its last stronghold in Pakistan. For instance, over the last few years, Pakistan has observed a drastic increase in polio cases.[3] A recent spike in polio vaccine misinformation on the internet has been identified as one of the biggest barriers for polio eradication.[2] To understand the proliferation of health misinformation online, a systematic literature review by,[4] revealed that health misinformation is prevalent on social media platforms globally and tends to be more popular than accurate information. Moreover, by shaping people's beliefs, intentions, and behaviors, exposure to inaccurate health statements has enormous potential to lead to dire consequences involving public health issues, especially vaccines.[5] For instance, beliefs in anti-vaccine conspiracy theories could reduce people's intention to vaccinate.[6]

## Polio cases and internet users in Pakistan

In 2012, 58 cases were reported while in 2013 the number increased to 93. In 2014, 307 cases were reported, which is the highest number of polio cases recorded in the country in recent years. In 2015, 54 cases were reported, 20 in 2016, 8 in 2017, 12 in 2018, 147 in 2019, and in 84 in 2020[7]. The fluctuation of these polio cases over the last few years indicates that Pakistan is still struggling to eradicate polio from the country.

Also, over the last few years, internet usage has drastically increased in Pakistan. According to,[8] the number of internet users in Pakistan increased by 11 million (+17%) between 2019 and 2020. Such popularity and the rapid penetration of the internet in the country naturally generates more content on issues of social importance, including polio vaccine. In countries like Pakistan, where the number of internet users has grown radically over the last few years, people have turned to online sources and social media to seek health information.[9]

## Misinformation on social media and spike in polio cases

On April 22, 2019, a false rumor on polio vaccine side effects was shared on Facebook, Twitter, and YouTube, which heavily impacted polio eradication efforts in the country. This misinformation on vaccine safety led to the escalation of a mob attack where a small hospital was set on fire in Peshawar, a high-risk district for polio.[10] Misinformation claiming that children fell sick after the administration of a polio vaccine was spread through social media.[11] After this viral fake video, which received more than 24,000 interactions (retweets and likes), chaos ensued, and thousands of parents brought their children to Peshawar's three main hospitals in anticipation that they might fall ill. The video showed a man claiming that the polio vaccine was harmful for children, with the camera cutting to a group of young boys who pretended to faint on cue from the cameraman. Many other parents refused to vaccinate their

children in the following days and weeks. Local mosques broadcasted warnings about the polio vaccine from their loudspeakers. Three people died in the hysteria, and Pakistani authorities suspended Pakistan's polio eradication campaign for 5 days after the flare-up of misinformation. Since then, over two million children have gone unvaccinated. Vaccine refusal numbers having skyrocketed since the misinformation incident. In Nowshera, a city in Khyber Pakhtunkhwa (KPK), vaccine refusal has leaped from 256 cases in March to 88,000 in April 2020. As a response to this incident, the Emergency Operations Center Khyber Pakhtunkhwa (KPK) launched a campaign with medical experts, parents, and polio health workers to counter rumors that polio vaccines cause sickness in children.[11] Twitter found that there was a spike in the frequency of polio-related hashtags on the platform on April 22, 2020, but overall numbers remained relatively low. For example, about 1,000 tweets containing the hashtag #nomorepolio between April 22 and 25, but the occurrence of the hashtag went down afterward.

## Tackling polio vaccine misinformation and future research

Research in this area has proposed best practices to deal with online misinformation.[12–14] But largely, these proposed guidelines missed context such as religious, social, political, and cultural elements. Some research in this line has adopted cultural attraction theory to study digital media and online misinformation, which has proven fruitful.[15] For example,[16] study suggested that false information thrives not because it is low-quality information but due to its high psychological attractiveness. Being false per se does not increase the chances of information to become culturally appropriate but having properties particularly appealing to the human mind does (e.g., eliciting threat, disgust or related to social relations, see infra). For example, in the current digital environment, information producers are encouraged to design clickbait content with catchy titles to spur internet users to react to them, for the purpose of clout, and to generate profit from their clicks. This has resulted in Pakistan observing a recent increase in internet users. Future studies in vaccine misinformation and vaccine communication online should focus on newer social media platforms such as Telegram, WhatsApp, and Instagram. Further, studies on polio vaccine misinformation on social media should utilize relationally and culturally informed approaches to contextualize and interpret users' intention to share these false claims. Examining polio vaccine misinformation through cultural lenses will help scholars to not only de-westernize theoretical frameworks but also bring new perspectives from the Global South. Findings will help policymakers in public health to curb misinformation about the polio vaccine not only in mobile instant messaging services (MIMS) but also in mainstream social media networks.[17]

This commentary provides several potential recommendations to tackle polio vaccine misinformation in Pakistan. 1) Instead of relying on big tech companies, Pakistani provincial and local health departments should engage directly with users on social media to correct misinformation about the polio vaccine. Research shows that local health departments can play an active role to counter anti-vaccination narratives online.[18] Some attempts have been made by the government of Pakistan and tech companies to tackle polio vaccine misinformation. For instance, on May 10, 2020, the platforms – Facebook, YouTube, and Twitter – responded, collectively blocking 174 anti-vaccination links. Facebook blocked 130, Twitter blocked 14, and YouTube blocked 30 links. Additionally, Twitter rolled out its vaccines advisory, which is designed to lead users to reputable sources on health information when they search for vaccine-related terms. But these efforts are not enough to address vaccine misinformation in Pakistan. 2) The Pakistan Telecommunication Authority (PTA) needs to expand its operations to combat vaccine misinformation online. 3) Responsible media coverage would enhance vaccine acceptance in the country. 4) Local professional news outlets need to be trained in best practices for social media content management and moderation. 5) Instead of punishing and arresting people who share vaccine misinformation on social media, Pakistan needs to enhance the capacity of Perception Management Initiative (PMI) to correct vaccine misinformation and provide factual information. At least 12 people were arrested as part of what the provincial health department terms a coordinated conspiracy to disrupt the polio immunization drive. 6) Polio Eradication Initiative should update its training manual according to the best suitable social and cultural approach to deal with online misinformation in Pakistan. 7) Polio healthcare workers need to be trained and equipped with digital, information, and internet skills to correct misinformation online. 8) Vaccine communication must acknowledge the uncertainty and take into account readers' and viewers' concerns. Information on local and provincial health departments should be simplified and made accessible. 9) Pakistan needs to accept that polio eradication is not solely the domain of international agencies, but Pakistan must take ownership by providing local funding, by developing local strategies, and by placing religious and political leadership at the forefront in the campaigns. 10) To mitigate the amount and spread of visual content related to vaccine misinformation, monitoring visual misinformation more closely, perhaps using the AI capabilities of Google's DeepMind would be helpful.

## Disclosure of potential conflicts of interest

No potential conflicts of interest were disclosed

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