

**Diphtheria's disturbing comeback: An alarming resurgence in Pakistan**Wajiha Fatima Khan<sup>1</sup>, Yusra Khan<sup>2</sup>, Safa Alam<sup>3</sup>, Shazia Rahim<sup>4</sup>, Farheen Malik<sup>5</sup>

Dear Respected Editor, Diphtheria, caused by *Corynebacterium diphtheria*, affects the throat and nasopharynx. Transmission occurs through airborne respiratory droplets, secretions, or direct contact. Toxigenic strains produce diphtheria toxin (DT) that causes local inflammation and necrosis of the pharynx, forming a characteristic gray and leathery pseudo membrane. Symptoms are fever, a sore throat, a swollen neck, and dysphagia. It can even lead to serious complications like pseudomembranous pharyngitis, myocarditis, and arrhythmias. Before the development of the toxoid vaccine for diphtheria, millions of people perished from the severe respiratory distress produced by the disease.<sup>1</sup> In the days before vaccinations, diphtheria was the leading cause of death in children.<sup>2</sup>

In 1980, Pakistan reported 14,328 cases of diphtheria with an incidence rate of 177.7.<sup>3</sup> Strong public health efforts reduced cases of diphtheria from thousands to hundreds within 15 years. Pakistan's launch of the Expanded Programme of Immunization (EPI) in 1978 significantly reduced diphtheria cases. From thousands in 1980, reported cases dropped to just 93 during 1995-2000 and a mere 9 during 2014-2015.<sup>3</sup>

Southeast Asia has borne the brunt of global diphtheria cases in the past decade, with Pakistan reporting the highest number (821 cases in 2018).<sup>1,3</sup> The disease recently resurfaced, tragically causing 45 deaths among children and teenagers in 2022.<sup>1</sup> In November 2022, flood-affected areas in Sindh, Punjab, and Khyber Pakhtunkhwa further reported around 70 suspected cases.<sup>1</sup> A concerning 50% increase in diphtheria cases in 2023 prompted the NIH to issue an outbreak advisory, urging vigilance and strong preventive measures by both the public and officials.<sup>4</sup> The significant population growth in Pakistan, exacerbated by a lack of family planning, wealth inequality and COVID-19

outbreak affecting the immunization coverage has led to the spread of diphtheria in recent years.<sup>5</sup>

Thus, to combat the rising diphtheria infection in Pakistan, we would like to make some recommendations:

1. High quality, accessible vaccines: Ensure high-quality vaccine availability in rural and urban areas, with 10-year booster shots for sustained immunity.<sup>1,3</sup>
2. Large-scale vaccination: Implement WHO/UNICEF-recommended strategies for large-scale vaccination coverage in Pakistan.<sup>1,3</sup>
3. Rural awareness campaigns: Address vaccine hesitancy through targeted awareness programmes in rural areas, highlighting benefits and dispelling misconceptions.<sup>1,3</sup>
4. Increased healthcare funding: Allocate increased budget for healthcare (NHSRC) to support vaccine production, storage, and distribution.<sup>4</sup>
5. Strict antibiotic adherence: Implement daily patient checklist to ensure complete antibiotic courses, preventing recurrence.<sup>4</sup>

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