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RISING BURDEN OF DENGUE FEVER IN PAKISTAN

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Dengue fever has become one of the most persistent and challenging public health threats in Pakistan. Over the last decade, the country has witnessed recurrent outbreaks, particularly during the monsoon and post-monsoon seasons, when environmental and climatic conditions favor the breeding of *Aedes aegypti* and *Aedes albopictus* mosquitoes [1]. Despite repeated waves and increasing disease burden, dengue continues to expose significant weaknesses in surveillance, prevention, and vector-control strategies across the nation. Urban centers like Lahore, Karachi, Rawalpindi, Peshawar, and Multan remain the most affected, largely due to rapid urbanization, overcrowding, water storage practices, and inadequate waste management. Poor drainage systems, accumulation of stagnant water, and limited awareness about household breeding sites allow mosquitoes to flourish [2]. Each year, thousands of individuals are hospitalized with dengue fever, dengue hemorrhagic fever (DHF), and dengue shock syndrome (DSS), placing immense pressure on emergency departments and intensive care units. Unfortunately, many cases go unreported, masking the true extent of the epidemic [3].

The challenge is intensified by climatic shifts. Rising temperatures, erratic rainfall patterns, and extended humid months have expanded mosquito breeding seasons. Climate-driven vector expansion has resulted in earlier outbreaks, prolonged transmission cycles, and spread to rural areas previously unaffected. Pakistan's experience reflects a broader regional pattern, where climate change and environmental mismanagement are accelerating the spread of vector-borne diseases [4]. While provincial health departments often initiate emergency fumigation and anti-larval spray campaigns, these short-term responses are insufficient. Past outbreaks have shown that reactive measures fail to curb transmission once dengue has already spread across the community [5]. The country urgently needs long-term, integrated vector-management programs focusing on community participation, environmental sanitation, and sustained eradication of mosquito breeding sites. Strengthening municipal waste disposal, improving drainage channels, and enforcing building codes for water management must become priority actions [6].

Another major obstacle is limited public awareness. Many households remain unaware of simple preventive measures such as covering water containers, eliminating standing water, using mosquito repellents, and installing window screens. Public health campaigns often start only after outbreaks have escalated, reducing their effectiveness [7]. Continuous year-round education through digital media, schools, mosques, and community health workers is essential to build a culture of prevention. On the clinical front, early diagnosis and standardized management protocols have significantly reduced mortality. However, overcrowded hospitals, shortage of platelets during peak seasons, and inconsistent laboratory reporting systems still undermine patient outcomes [8]. The introduction of trained dengue response teams, improved data reporting, and timely community alerts could significantly enhance case detection and outbreak control [9].

Pakistan cannot afford to continue in a cycle of seasonal crisis. A coordinated national dengue control program, integrating environmental, clinical, and community-level strategies, is urgently needed. Investment in public health infrastructure, climate-responsive planning, and community engagement must become long-term national commitments. Dengue fever is preventable [10]. With sustained action, scientific planning, and strong public participation, Pakistan can significantly reduce the burden of this disease and protect millions of vulnerable lives from future outbreaks.

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