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Short Communication

Strengthening Health Systems for Climate Resilience: An Urgent Priority in Pakistan

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Abstract

Objective: This short communication highlights the health consequences of the 2025 monsoon floods in Pakistan, situating them within the broader historical trajectory of climate-related calamities and aligning national realities with global climate justice commitments.

Methods: A narrative review of government reports, humanitarian updates, and international policy documents was conducted to examine the health impacts of the 2025 floods and contextualize them with past disasters, including the 2010 and 2022 floods. Pakistan's commitments at COP 29 were also analysed.

Results: By late August 2025, the floods had claimed over 820 lives, displaced more than one million individuals, and caused extensive damage to infrastructure. Health impacts extended beyond acute fatalities, with outbreaks of diarrheal and vector-borne diseases, disruption of maternal and chronic disease services, and heightened risks of malnutrition and psychological distress. Damaged facilities, supply chain interruptions, and overstretched health workers further undermined service delivery, echoing systemic weaknesses observed during earlier disasters.

Conclusion: Pakistan's recurring climate shocks highlight the urgent need to embed resilience into health system strengthening. Climate-proofed infrastructure, robust surveillance, continuity of care, and equitable international financing are critical. Health security in Pakistan is inseparable from climate justice, requiring both national action and sustained global solidarity.

Keywords: Climate resilience, health systems, Pakistan, floods, climate justice, public health adaptation

Introduction

Climate change has increasingly been recognized as the most pressing public health challenge of the 21st century, exerting profound and unequal impacts (1) across the globe. The World Health Organization (WHO) projects that between 2030 and 2050, climate change will cause an estimated 250,000 additional deaths annually from malnutrition, malaria, diarrhea, and heat stress[1]. Low- and middle-income countries (LMICs) remain disproportionately affected due to limited adaptive capacity, weak infrastructure, and high population vulnerability (2-4).

Globally, climate-related disasters have already had measurable impacts on health service delivery (3). A 2022 WHO assessment found that more than half of the world's health facilities in low-income countries are inadequately prepared for climate shocks, while the World Bank estimates that over 25% of health facilities in disaster-prone regions face recurrent damage from floods and storms. During the 2010 Haiti earthquake, for example, 60% of health facilities in affected areas were rendered non-functional, while the 2014 floods in South Asia disrupted maternal and child health services for millions of women and children (5). Such

statistics underscore the fragility of health systems in the face of recurrent climate calamities. Pakistan, in particular, has emerged as an epicenter of climate-induced health crises. Consistently ranked among the top ten most climate-vulnerable nations, the country has faced recurrent environmental shocks, such as catastrophic floods, prolonged heatwaves, droughts, and accelerated glacial melt, each compounding existing socioeconomic fragilities. The 2010 super floods, the 2015 Karachi heatwave, the devastating 2022 monsoon floods that submerged one-third of the country, and the record-breaking 2023 heat season illustrate a dangerous pattern of escalating frequency and intensity of climate disasters. Each of these events has translated into significant loss of life, heightened disease burden, forced displacement, and a widening strain on already fragile health systems (1,5)

The 2025 floods have further reinforced this trajectory, once again overwhelming public health infrastructure, disrupting essential services, and exacerbating mortality and morbidity across affected provinces. These events underscore that climate change in Pakistan is not a distant or hypothetical concern; it is a lived reality with immediate health consequences. Importantly, they also highlight the urgent need to transition from reactive disaster response toward proactive, climate-resilient health system strengthening (6).

This short communication situates the health consequences of the 2025 floods within the broader historical context of Pakistan's climate calamities, highlighting the recurrent cycle of mortality, morbidity, and systemic disruption. It also links national experiences to the global discourse on climate justice, particularly Pakistan's commitments and expectations following the deliberations of COP 29, where the call for equitable climate finance and health system resilience was placed at the forefront (4).

Recent Floods in 2025

The 2025 monsoon season resulted in devastating floods across several provinces, causing widespread destruction and loss of life. By the end of August, the disaster had claimed more than 820 lives and displaced over one million individuals. The province of Khyber Pakhtunkhwa (KP) experienced particularly severe impacts, including landslides and flash floods, with the Buner District alone reporting over 150 fatalities. Urban areas such as Karachi were struck by intense cloudbursts, which overwhelmed local drainage systems and resulted in hundreds of casualties. Children were especially vulnerable, with at least 85 deaths and 162 injuries recorded by mid-July, often due to collapsing infrastructure and unsafe housing conditions. These statistics underscore not only the magnitude of the recent monsoon events but also highlight persistent weaknesses in disaster preparedness and public health responses (7)

Health Impacts: Mortality, Morbidity, and Disruptions

Flood-related health consequences extend beyond immediate fatalities:

1. **Infectious Diseases**: Contaminated water sources precipitated outbreaks of diarrheal diseases, malaria, dengue, and skin infections.

2. **Chronic and Maternal Health:** Interruption of supply chains and closure of health facilities compromised care for chronic illnesses, antenatal services, and routine immunization.

3. **Mental Health and Nutrition:** Displacement, loss of livelihoods, and food insecurity heighten risks of depression, anxiety, and malnutrition among vulnerable populations.

4. **Health System Disruptions:** Damage to infrastructure, loss of medical supplies, and overburdened health workers constrained service delivery, echoing the collapse seen in the 2022 floods when 13% of health facilities were destroyed.

Historical Context of Climate Calamities

Pakistan's vulnerability is chronic and cumulative. The 2022 super floods claimed over 1,700 lives, affected 33 million people, and caused losses exceeding US$ 30 billion. Past disasters, including the 2010 floods and recurrent droughts in Sindh and Balochistan, have repeatedly revealed the fragility of health and social protection systems. These cyclical crises demonstrate the urgent need for systemic adaptation rather than piecemeal emergency response (7)

COP 29 and Pakistan's Commitments

At the 29th Conference of the Parties (COP 29) in Baku (2024), Pakistan's leadership emphasized the principle of *climate justice*. Prime Minister Shehbaz Sharif reiterated that climate-related damages are a global responsibility, urging developed nations to fulfill pledges of adaptation and loss-and-damage financing. Pakistan endorsed the *Baku Climate Unity Pact*, while its climate envoy stressed that international financing must be predictable, equitable, and grant-based to enable investments in resilient infrastructure, including health systems (5,7)

The Way Forward

Strengthening climate-resilient health systems in Pakistan in the health sector focuses on four key areas. Infrastructure resilience involves climate-proofing hospitals and deploying mobile health units in flood-prone regions to ensure service continuity during disasters. Surveillance and early warning systems will be enhanced through improved disease monitoring, strengthened water and sanitation measures, and the establishment of rapid response teams to manage climate-related health risks. Continuity of care will be prioritized by safeguarding maternal, child, and chronic disease services during emergencies to prevent disruption of essential healthcare. Finally, financing and global solidarity will be advanced by operationalizing COP 29 pledges to ensure sustained, debt-free climate financing that supports long-term health system resilience.

Conclusions

Pakistan's recent flooding underscores the critical need to embed climate resilience within health system strengthening. In the absence of meaningful adaptation, preventable deaths will persist, health disparities will widen, and the country's progress will remain at risk. Advancing health security in Pakistan is intrinsically linked to climate justice, demanding both sustained national action and international support.

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