Case Report

Case Report: Post-Flood Health Impact Following the 2025 Buner Floods in Pakistan

Ummaima Asif[1, *], Asif Maqsood Butt[1], Sadia Ahmed[2], Aamir Afzal[4].

Abstract

The recent floods in different regions of Pakistan caused massive disaster and deaths. The present study is based on the post-flood relief activities done by Rawalpindi Medical University, Rawalpindi, Pakistan. The 2025 floods in District Buner, Khyber Pakhtunkhwa, Pakistan has caused extensive collateral damage in terms of deaths, individual displacement, and disruption of the health care facilities. The current report highlights the clinical data related to airborne communicable diseases such as acute respiratory infections, malaria, diarrhea, and skin infections. This case report highlights clinical presentations, healthcare challenges, and climate-related drivers behind the disaster. A total of 500 patients (265 male, 235 female) were assessed in relief camps, with acute respiratory infections, diarrheal diseases, malaria, and skin infections being the most frequent. The current study emphasizes the climate change extremities in Buner district, which are life-threatening weather events, and health vulnerabilities faced in such effected area having a very low resource settings and a lack of basic health care facilities.

Keywords: Flood, collateral damage, health care facilities, airborne disease

Contributions:
UA - Conception, Design
AMB, UA - Acquisition, Analysis, Interpretation
AMB, UA - Drafting
MO - Critical Review

All authors approved the final version to be published & agreed to be accountable for all aspects of the work.

Conflicts of Interest: None
Financial Support: None to report
Potential Competing Interests: None to report

Received 17/02/2025
Accepted 21/02/2025

Introduction

Climate change has intensified extreme weather events in South Asia, with Pakistan among the most climate-vulnerable countries (1). In August 2025, a cloudburst in Buner district led to catastrophic flooding, landslides, and deaths of more than 200 people (2). This case report documents the health impacts observed by the Rawalpindi Medical University (RMU) medical team during a post-flood relief initiative, linking clinical findings to broader climate-health dynamics.

Case Presentations Daggar (District Headquarters)

Between 23 and 24 August 2025, RMU medical teams provided emergency relief in Koz Gomand and Qadar Nagar camps, treating 500 patients.

The recent floods in District Buner, Khyber Pakhtunkhwa, have caused widespread displacement, damage to infrastructure, and significant health concerns. Major affected areas include:

- **Daggar (District Headquarters –** Population ~50,000; Affected ~15,000; 16 km from main city
- **Pir Baba –** Population ~30,000; Affected ~10,000; 24 km from main city
- **Mandar –** Population ~20,000; Affected ~7,000; 12 km from main city
- **Chagharzai –** Population ~25,000; Affected ~8,000; 28 km from main city
- **Gadezai –** Population ~18,000; Affected ~6,000; 22 km from main city

Total District Population: ~143,000
Estimated Flood-Affected Population: ~46,000

The floods have disrupted health services, clean water supply, food availability, and road connectivity, with a high risk of water-borne diseases**,** vector-borne infections, and worsening of chronic illnesses. Floods in Buner kill more than 200 people (3).

In Buner, a district in Khyber Pakhtunkhwa about 100km (62 miles) northwest of the capital, Islamabad, at least 207 people have been killed over two days as floods and landslides swept through villages and destroyed homes (2).

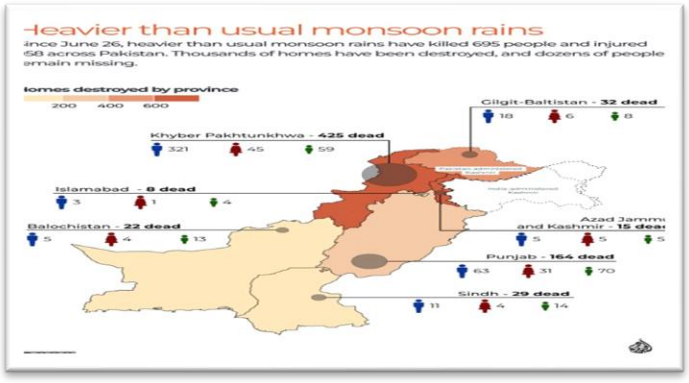

Figure 1: The Facts after the Flood in Pakistan

Members of the Urban Search and Rescue team search for bodies in the debris of damaged houses after a storm caused heavy rains and flooding in Bayshonai Kalay, Buner district, on August 17, 2025 [Akhtar Soomro/Reuters]

Buner is predominantly hilly with steep slopes that feed into narrow valleys. The district's loose, erosion-prone soil, coupled with deforestation, makes it vulnerable to landslides and flash floods. Satellite images of Buner show mountains and surrounding villages, including the town of Pir Baba, engulfed in mud and debris after the floods.

Figure 2: Flood-affected area of Buner

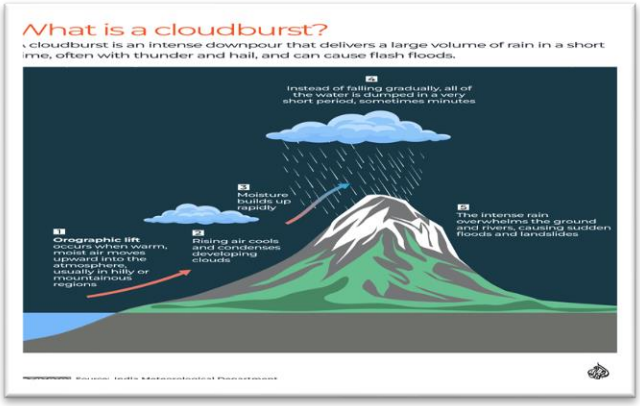

Figure 3: Cloudburst mechanism of action

What is Cloudburst?

Officials said Buner was hit by a cloudburst, a rare phenomenon in which more than 100mm (4 inches) of rain falls within an hour in a small area. In Buner, there was more than 150mm (6 inches) of rain within an hour on Friday morning (4).

Figure 4: Cloudburst areas of District Buner, KPK

Cloudbursts typically occur in mountainous regions during the monsoon season, when weather conditions can produce sudden, localized downpours leading to landslides. Cloudbursts tend to occur over a small area of 20 to 30sq km (7.7 to 11.6sq miles) and are often accompanied by thunder, lightning, and sometimes hail. Search efforts focused on areas where homes were flattened by torrents of water that swept down from the mountains, carrying massive boulders that smashed into houses like explosions. You can say that those who survived have gone mad," Saad Ahmed, pointing to a house where just one family member still lived.

Pakistan's destructive monsoon season

In Pakistan, the monsoon season typically runs from July to September, with peak rainfall usually occurring in August. Since late June, torrential monsoon rains have battered Pakistan, triggering landslides and flash floods that have killed more than 650 people and injured nearly 1,000, according to officials. Lieutenant General Inam Haider Malik, the chairman of the National Disaster Management Authority, said at a news conference in Islamabad that Pakistan was experiencing shifting weather patterns because of climate change (5-6). "The intensity of this year's monsoon is around 50 to 60 percent more than last year," Haider said. The worst- hit province is Khyber Pakhtunkhwa, where 425 deaths have been recorded, followed by 164 in Punjab. More than half of the fatalities were caused by flash floods, while about a third resulted from house collapses. Housing damage has also been severe: 941 in Khyber Pakhtunkhwa and 719 in Azad Jammu and Kashmir were reported destroyed or damaged, highlighting the scale of destruction to shelter and infrastructure. In total, 2,707 homes have been damaged (7-9).

Early warning systems

Angry residents in Buner accused officials of failing to warn them to evacuate. There was no warning broadcast from mosque loudspeakers, a traditional method in remote areas (10).

The government said that while an early warning system was in place, the sudden downpour in Buner was so intense that the deluge struck before residents could be alerted.

Pakistan is prone to natural disasters

Pakistan is among the world's most climate-vulnerable countries and grapples with extreme weather that is becoming more frequent and more intense (7).

Key Observations

- **Healthcare disruption:** Closure of BHUs and RHCs due to damaged infrastructure and lack of medicines.
- **Acute illnesses:** High prevalence of diarrhea, respiratory tract infections, eye infections, and skin diseases.
- **Chronic illness risks:** Patients with diabetes and hypertension are facing treatment interruptions.
- **Child health:** Shortage of milk, ORS, and antibiotics, with rising cases of dehydration and malnutrition.
- **Surgical needs:** Increased cases of injuries, wound infections, and fractures, requiring surgical kits.
- **Logistics:** Difficulties in reaching remote valleys due to landslides and washed-out roads.

The facts and findings by Dr. Akhtar-Buner, Orthopedic Surgeon: Summary of current clinical findings along with the critical support required to maintain and enhance patient care:

Clinical Observations

Infected Wounds

- Several patients present with infected wounds, largely due to inadequate antibiotic coverage and poor dressing practices.
- Although the number of injured patients is manageable, these cases require broad-spectrum antibiotics and proper wound care protocols (11).
- **Orthopedic Trauma**
- All trauma cases are currently stable and managed, Alhamdulillah.
- However, some patients were referred due to the unavailability of a C-arm (fluoroscope), which is essential for surgical imaging and follow-up.
- **Malaria Cases**
- A surge in malaria cases has been noted by our medical team and other healthcare providers (12).
- Delayed presentation is common, as many patients are initially treated symptomatically in local camps without proper malaria testing.

Dermatological Issues

An increase in contact dermatitis has been observed, likely caused by environmental factors, poor sanitation, and inappropriate use of topical substances (13).

Post-Drowning Pneumonia

A limited number of pneumonia cases linked to drowning have been reported. These require respiratory monitoring and targeted antibiotic therapy (14-15).

Support Required

Human Resource

- Clinical Psychologist (preferably female) – Needed on a long-term basis to support mental health services, especially for trauma-affected women and children.
- Gynecologist – To address maternal health, antenatal/postnatal care, and gynecological emergencies in the community.

Laboratory Upgradation

To support accurate diagnosis and timely interventions, the following lab improvements are needed:

- Basic Hematology and Biochemistry Analyzers
- Microscope with adequate illumination
- Centrifuge Machine
- Rapid Diagnostic Kits (Malaria, Dengue, Typhoid)

Logistic & Equipment

- Cardiac Monitor – For emergency and critical care settings.
- Glucometers – For ER and diabetes patient management.

Challenges

Shortage of essential **medicines and surgical supplies** (9).

1. Inaccessibility of certain **remote affected villages**.
2. High risk of **epidemics (diarrheal outbreaks, malaria, dengue, conjunctivitis)**.
3. Lack of **specialist medical staff** in affected areas.
4. Limited **emergency transport** and **evacuation facilities**.

Recommendations

1. Immediate supply of **essential medicines, surgical kits, and nutrition for children** .
2. Establishment of **mobile health units** in affected areas.
3. **Chlorination of water sources** and **distribution of ORS** to prevent outbreaks.
4. Deployment of **specialist teams** (medicine, pediatrics, surgery, ophthalmology).
5. Strengthening **disease surveillance and rapid response system** in collaboration with local health department.
6. Long-term **rehabilitation plan** for health infrastructure and community resilience.

Table 1: Relief Supply Requirements (for 46,000 affected people)

Category	Item	Quantity Required
Medicines & Medical Supplies	Broad-Spectrum Antibiotics	20,000 strips
	Tab Nezkil 600mg	10,000 tabs
	Tab Gen-M 80/480mg	15,000 tabs
	Tab Gen-M 20/120mg	15,000 tabs
	Inj Gen-M	5,000 vials
	Inj 2-Sum	5,000 vials
	Tobra-D Eye Drops	3,000 bottles
	Eye Mox Drops	3,000 bottles
	Polyfax Eye Ointment	2,500 tubes
	ORS Sachets	50,000 sachets
	Milk for Children (400g tins)	6,000 tins
	Tab Cefiget 400mg	10,000 tabs
	Inj Insulin 70/30	3,000 vials
	Anti-Hypertensive Drugs	12,000 strips
	Anti-Diabetic Drugs	8,000 strips
	Enterogermina Sachets	5,000 sachets
	Tab Naproxen 500mg	8,000 tabs
	Malaria Rapid Diagnostic Kits	2,000 kits
Surgical Supplies	Sterile Gloves (pairs)	10,000
	Sterile Gauze (packs)	5,000
	Sutures Prolene 2/0	2,000
	Sutures Prolene 1	2,000
	Sutures Vicryl 2/0	2,000
	Sutures Vicryl 1	2,000
	Humby Knife	100
	Surgical Instrument Sets	50
	Wound Dressing Materials	5,000 packs
	Suction Machine	25

400 Flood affects were provided with medical treatment at Koz GOMAND & 100 at Qadar Nagar, Buner, Swat

جس نے ایک انسان کی جان بچائی گویا اس نے پوری انسانیت کی جان بچائی" (القرآن: سورۃ المائدہ - آیت 32)

Rawalpindi Medical University
Buner Donation for Flood Relief 2025

Table 2: Medicine List Commercial Packs

S.NO	Name	Type	Quantity
1	Zinc Sulphate	Syp	200
2	Augmentin	Syp	200
3	Graviate	Syp	280`
4	Cough Syp	Syp	500`
5	ORS	Sachets	3000
6	Nasal Saline	Drops	200
7	Metronidazole	Tab	400
8	Metronidazole	Syp	200
9	Multivitamins	Tab	2000
10	Vitamin D	Tab	2000
11	B Complex	Tab	2000
12	Paracetamol	Syp	500
13	Eye Drops	Drops	960

Authors Information

[1] Department of Community Medicine, Rawalpindi Medical University, Rawalpindi
[2] Department of Gastroenterology, Holy Family Hospital, Rawalpindi
[3] Research & Development Department, Rawalpindi Medical University, Rawalpindi
*** Corresponding author**: Ummaima Asif (omaima@rmur.edu.pk)

References:

1. Alderman K, Turner LR, Tong S. Floods and human health: A systematic review. **Environ Int.** 2012;47:37-47. doi: **10.1016/j.envint.2012.06.003**.
2. Sarkar S. Pakistan floods pose serious health challenges. **BMJ.** 2022;378:o2141. doi: **10.1136/bmj.o2141**.
3. Du W, FitzGerald GJ, Clark M, Hou XY. Health impacts of floods. **Prehosp Disaster Med.** 2010;25(3):265-272. doi: **10.1017/S1049023X00008141**.
4. Saulnier DD, Brolin K, von Schreeb J. No calm after the storm: A systematic review of human health following flood and storm disasters. **Prehosp Disaster Med.** 2017;32(5):568-579. doi: **10.1017/S1049023X17006574**.
5. Shimi AC, Parvin GA, Biswas C, Shaw R. Impact and adaptation to flood: A focus on water supply, sanitation and health problems of rural communities in Bangladesh. **Disaster Prev Manag.** 2010;19(3):298-313. doi: **10.1108/09653561011052484**.
6. Du H, Zhang W, Zhang M, et al. Health risks of flood disasters. **Clin Infect Dis.** 2018;67(9):1450-1454. doi: **10.1093/cid/ciy227**.
7. Khan M, Shah SH, Khan SA. Post-flood infectious disease prevention and control: Current scenario in Pakistan. **J Flood Risk Manag.** 2023;16:e12867. doi: **10.1111/jfr3.12867**.
8. Alied M, Nguyen-Tien T, et al. Disaster after disaster: The outbreak of infectious diseases in Pakistan in the wake of 2022 floods. **Ann Med Surg (Lond).** 2024;86:891-898. doi: **10.1097/MS9.0000000000001597**.
9. Luangnara A, Towachiraporn S, Wiwatkunupakarn N, Thongwitokomarn H. Impact of flooding events on waterborne

and vector-borne infections: A systematic review. **BMC Infect Dis.** 2026;26. doi: **10.1186/s12879-026-13442-z**.
10. Bamidele JO, et al. Epidemiology of floods in sub-Saharan Africa: A systematic review of health outcomes. **BMC Public Health.** 2022;22:292. doi: **10.1186/s12889-022-12584-4**.
11. World Health Organization. *Climate change and health*. Geneva: WHO; 2023. Available from: https://www.who.int/news-room/fact-sheets/detail/climate-change-and-health
12. Intergovernmental Panel on Climate Change. *Climate Change 2023: Synthesis Report*. Geneva: IPCC; 2023. Available from: https://www.ipcc.ch/report/ar6/syr/
13. World Health Organization. *World Malaria Report 2024*. Geneva: WHO; 2024.
14. Sphere Association. *The Sphere Handbook: Humanitarian Charter and Minimum Standards in Humanitarian Response*. 2018 ed. Geneva: Sphere Association.
15. World Health Organization. *Emergency Medical Teams: Technical Standards and Recommendations*. Geneva: WHO; 2021.