RESEARCH BRIEF

EVIDENCE BASED POLICY RECOMMENDATION FOR CLIMATE RESPONSIVE, INCLUSIVE HIV / STI / NCD CARE

UNDP

INDIAN COUNCIL OF MEDICAL RESEARCH

NATIONAL INSTITUTE FOR RESEARCH IN BACTERIAL INFECTIONS

World Health Organization

WBSAP & CS

Based on the Project Titled:

"Assessment of comorbidity pattern, HIV care services and socio-behavioural dynamics among People Living with HIV / AIDS in different geo-climatic regions: An exploration using mixed method design"

This brief presents an overview of how geo climate factors impact care of People Living with HIV/ AIDS and advocate towards a holistic and inclusive climate sensitive HIV / STI care policy.

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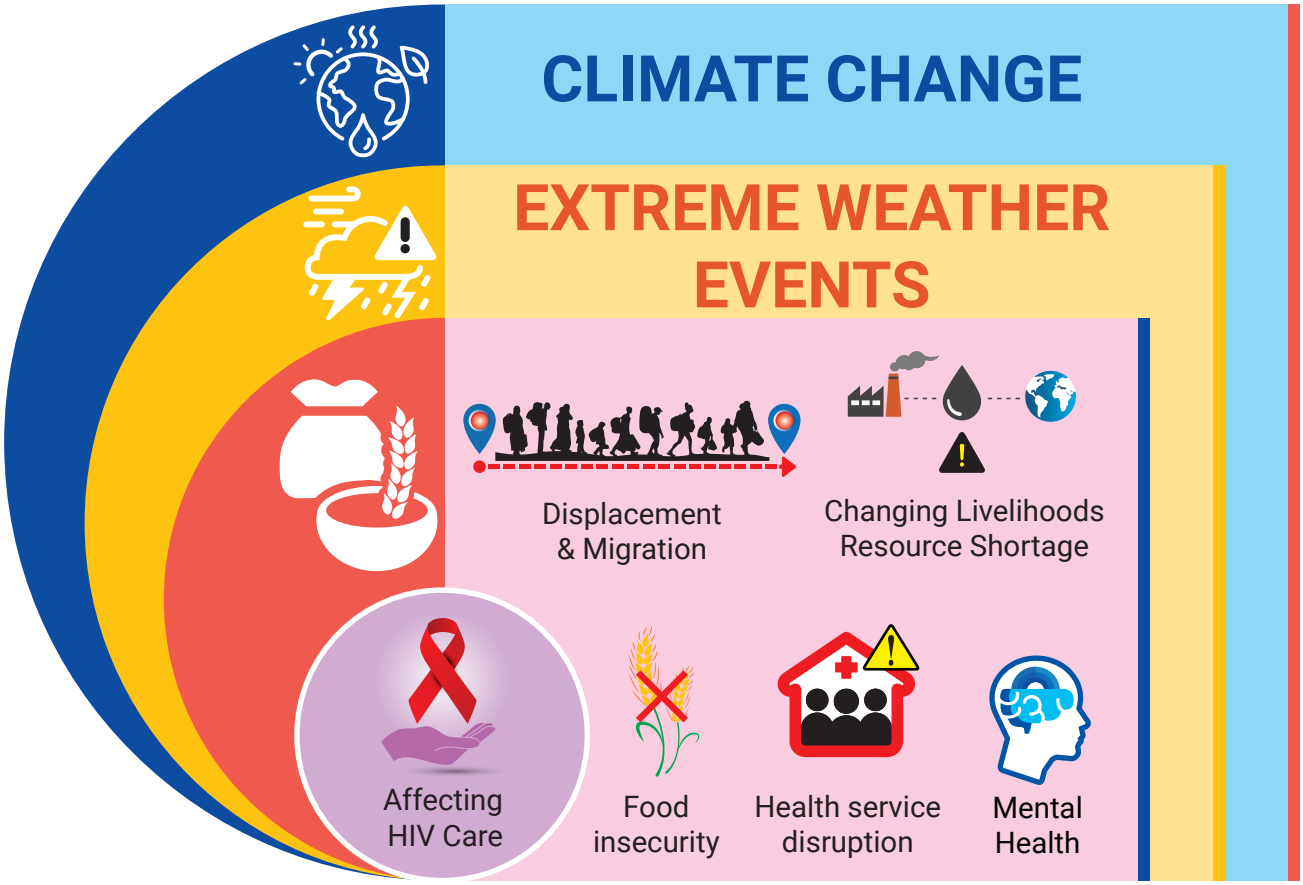
Conceptual Framework



Purpose of the Study

Climate change acts as a catalyst of interconnected vulnerabilities, influencing health, livelihoods, and service delivery systems. Extreme weather events such as floods, droughts, and cyclones disrupt health infrastructure, interferes supply chain of medicine and health services and restrict mobility, leading to treatment interruptions for people living with HIV (PLHIV). Climate Change impacts also affect different geo -climatic regions and different population group disproportionately. Also different geographical conditions have different disease vulnerability which impacts the overall health care of an PLHIV from the "one body one health" notion

As climatic instability worsens, displacement and migration rise, uprooting individuals from established care networks. Food insecurity and changing livelihoods reduce nutritional intake and income, both crucial for ART adherence. Simultaneously, mental health distress grows due to uncertainty, loss, and stigma, often leading to reduced motivation for continued treatment.

The gender dimension amplifies these effects—women face unequal resource access and increased caregiving burdens, while men often delay seeking care. Health service disruptions, including supply chain breakdowns and staff shortages during disasters, further weaken ART continuity.

These interlinked forces create a feedback loop, where social, environmental, and psychological stressors compound each other, ultimately undermining viral suppression and long-term health outcomes.

Building climate-resilient HIV programs—through decentralized ART services, mobile outreach, flexible documentation, and integrated mental health and nutrition support—is vital to sustain treatment in the face of growing climate threats. This study and the report generated thereof thus advocates for consideration of climate sensitive HIV/ STI care policies from the one health perspective.

Study Objectives

STRATEGY 01 To assess the co-morbidity pattern among PLHIVs in different geo-climatic regions

STRATEGY 02 To determine the status of HIV care and treatment services among PLHIVs

STRATEGY 03 To explore any climate sensitive socio-behavioral attribute impacting HIV response

Methodology

The study site was divided into four geographically demarcated zones (Temparate, Flood prone, Coastal and Hilly regions of West Bengal) to ensure regional representation and comprehensive coverage of the target population. The data collection comprised two primary components: (1) quantitative sampling and analysis, and (2) qualitative interviews.

1. Quantitative Component: Sample Collection and Analysis

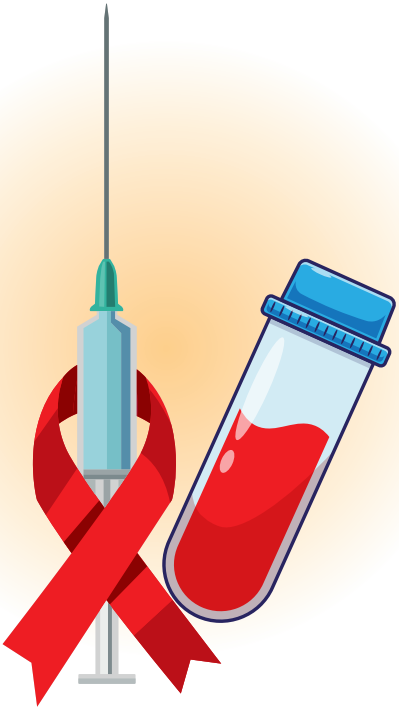
A total of **400 PLHIV (100 each zone)** have been successfully enrolled across all four study zones.

400 blood samples have been processed, and the analytical reports have been collected. The results have been securely stored and catalogued for further statistical analysis. This phase of the project marks the successful completion of the quantitative data collection component, which serves as a foundational dataset for the project's subsequent analytical and interpretative phases.

2. Qualitative Component: Key Informant and In-Depth Interviews

These interviews were carried out with the support of trained qualitative researchers who utilized semi-structured interview guides. Use of open-ended questions were allowed for flexible yet directed conversations, enabling capture of both anticipated and emergent themes relevant to the study objectives.

The 12 key informants included a diverse mix of stakeholders such as medical officers, counsellors, pharmacists, and program coordinators, thereby providing a multidimensional view of service delivery. On the other hand, 38 IDIs with PLHIVs on ART for minimum three years residing in same region aimed to explore their perspectives on accessibility, adherence, stigma, and support systems.



Key Observations

1. Accessibility of ART Services

Across all study zones, **physical inaccessibility** was the most prominent barrier. In flood-prone and coastal regions, entire villages were often cut off from ART centers due to damaged bridges and submerged roads. The nearest health facilities became unreachable, and communication systems often failed. For many, missing doses was unavoidable, and the anxiety that followed was palpable.

Flood-prone Zone:

"The road was under water for days. I missed my ART dose. Later, the health worker came in a boat with our medicines. Without them, I would have fallen sick."

In this community near a river, floods are an annual ordeal. The respondent, a **39-year-old woman, described how she and several others were stranded for over a week without medication.**

The local ASHA, accompanied by a village youth volunteer, used a makeshift wooden boat to deliver ART refills door-to-door.

This act of persistence transformed fear into relief and reinforced **trust between the health system and the community**. The episode encapsulates how **grassroots-level adaptation and improvisation** play a crucial role in safeguarding treatment continuity in disaster-prone areas.

2. Community & Social Support

Social and peer support networks emerged as a lifeline for adherence. In hilly terrains where roads frequently collapse after heavy rainfall, women's groups and local ASHAs became the backbone of informal ART monitoring. They reminded members of pill timings, motivated those who felt hopeless, and often pooled small funds to help someone reach the nearest ART centre.

Hilly Zone:

"Even when the road was blocked by landslides, our ASHA came walking with medicines. The women in our group also remind each other not to skip doses."

This story came from **a 42-year-old female tea garden worker from Darjeeling district.** Her hamlet remains disconnected for several days each monsoon due to landslides. She recounted how their ASHA worker, carrying a sling bag filled with medicines, traversed narrow, slippery paths to deliver ART.

Meanwhile, women's group members in her community maintain a small notebook tracking each person's pill adherence. Their informal support structure — built on **solidarity, empathy, and shared experience and local level adaptation** — exemplifies how **community cohesion compensates for systemic gaps**. This collective vigilance transformed adherence from an individual responsibility into a shared commitment.

3. Health System Responsiveness

The responsiveness of the health system differed across geographic contexts. In flood and coastal areas, health staff demonstrated remarkable adaptability — arranging mobile ART vans, house-to-house medicine delivery, and reminder calls. However, in the temperate zones, where infrastructure was more stable, interaction quality declined — visits were shorter, and emotional engagement was minimal.

Temperate Zone:

"The doctor only gives medicines; he doesn't explain why I'm gaining weight or having dizziness. I wish they talked to us more."

A 33-year-old man from an urban centre shared his frustration with the "routine" nature of his visits. Although ART supply was consistent, he felt treated as a number in a queue, not as a person living with a chronic condition. His unaddressed side effects created anxiety and distrust.

This narrative reflects the **silent gap between technical delivery and compassionate care.** When counselling and explanation are sidelined, adherence becomes mechanical — sustained by obligation rather than understanding. It underlines the importance of **restoring communication and empathy as clinical tools**.

4. Environmental & Structural Challenges

Natural disasters repeatedly interrupted ART supply chains and destroyed patient documentation. Cyclones and floods not only displaced families but also erased their medical identity — their ART cards, records, and prescriptions. Health systems, bound by procedural rigidity, often required proof of treatment history before issuing refills — a barrier that compounded trauma for already vulnerable patients.

Coastal Zone:

"The cyclone washed away my house and my ART card. The clinic refused to give medicines without proof. Later, the mobile van helped me restart."

This came from a widowed 45-year-old woman living along the coastal belt bordering Odisha. When Cyclone Fani hit, she lost her home, ration card, and all medical records. For three weeks, she survived on borrowed food and fear — her medicines gone, her strength fading.

When a mobile ART van finally arrived, tears came in relief. "They gave me new medicines and a new card," she said, "as if life began again."

Her story exposes **systemic fragility**, where administrative rigidity delayed life-saving care. Yet, it also showcases **innovation in outreach** — the mobile ART van becoming a literal vehicle of recovery and dignity. It emphasizes the urgent need for **flexible, decentralized service models** and **digital backup systems** to ensure care continuity.

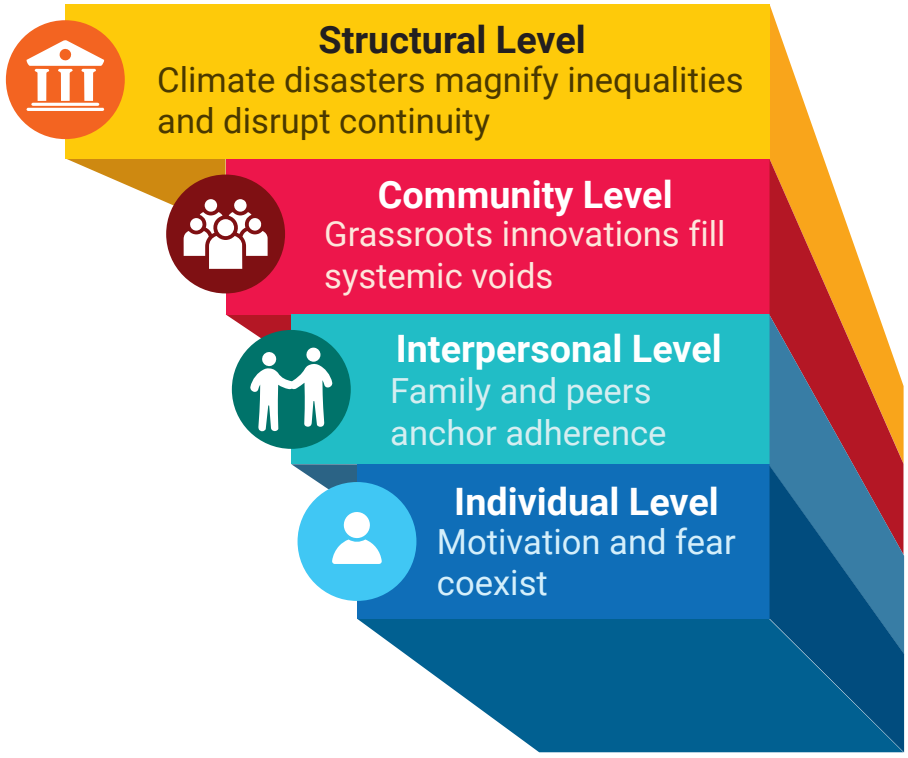
Synthesis: The Socio-Ecological Web of Adherence

The voices from across these diverse zones converge into a coherent picture of **interlinked vulnerabilities**:

- At the **individual level**, motivation and fear coexist.
- At the **interpersonal level**, family and peers anchor adherence.
- At the **community level**, grassroots innovations fill systemic voids.
- At the **health system level**, responsiveness varies from proactive to perfunctory.
- At the **structural level**, climate disasters magnify inequalities and disrupt continuity.

Together, these layers form a **cycle of resilience and fragility** — where environmental shocks trigger health disruptions, which in turn deepen poverty, stigma, and mental distress. Yet, amid these challenges, stories of courage, solidarity, and adaptation shine through — proving that **resilience is not accidental but cultivated**.

The Socio-ecological Web of Adherence



Policy and Programmatic Implications

- Integrate climate-resilient strategies within HIV / STI care protocols — pre-position ART stocks, maintain mobile health units, and adopt teleconsultation during disasters.
- Institutionalize flexible documentation policies for rapid ART refills post-disaster.
- Empower community-based networks such as women's groups and peer educators as active resilience partners.
- Train providers in empathetic communication and patient counselling.
- Align HIV service continuity plans with NPCCHH and state disaster management frameworks for integrated preparedness.

Compounding Catastrophe: How Climate Change, Systemic Gaps Affect HIV Care and Prevention

A. Environmental & Systemic Drivers of Vulnerability

Climate and Geography as Multipliers of Risk:

Direct Service Disruption: Extreme weather (floods, landslides, cyclones) physically blocks roads, disrupting access to ART clinics, medication, and condom supplies.

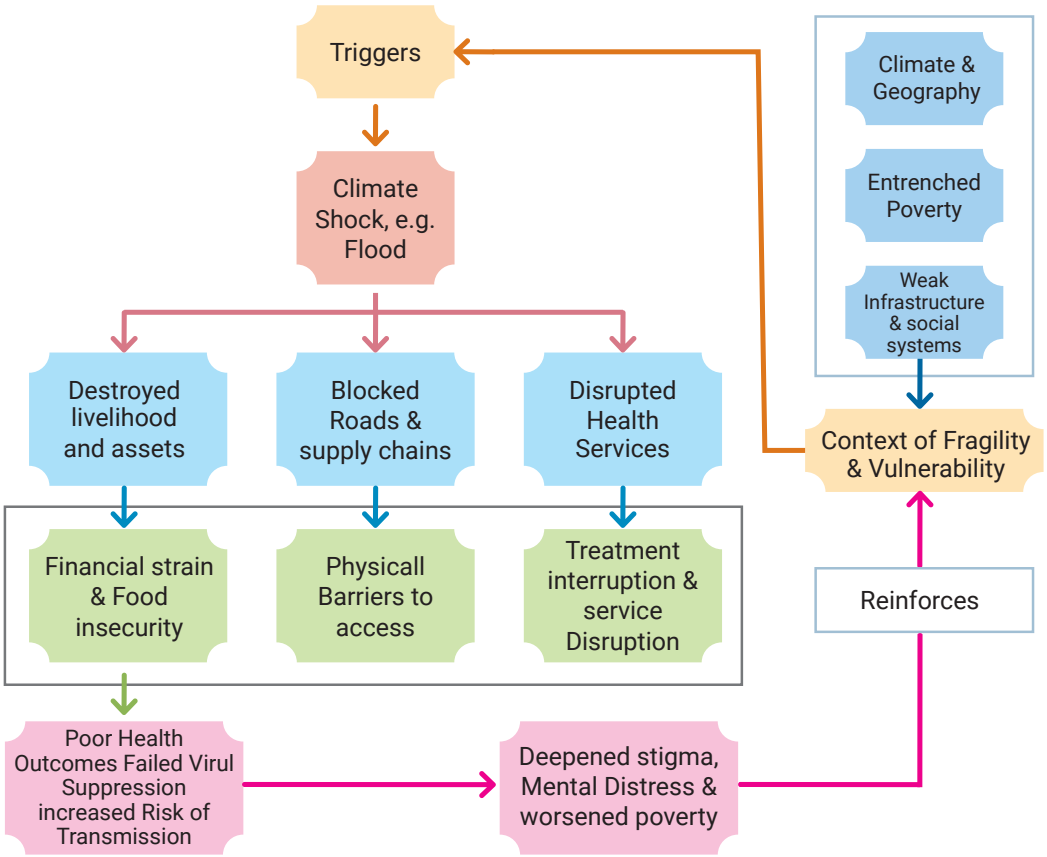
Economic Destabilization: Climate shocks destroy livelihoods based on climate-sensitive agriculture and daily wage labor, pushing families deeper into poverty.

Educational Disruption: Schools are closed or become inaccessible due to climate events, perpetuating cycles of illiteracy and poverty.

Entrenched Poverty and Limited Infrastructure: Occupational Structure: Dependence on low-income, unstable work conflicts with rigid clinic appointment schedules.

Geographic Isolation: Remote, difficult terrain limits access to markets, jobs, high-quality healthcare, and educational institutions.

Systemic Gaps: Poor digital and transport connectivity, combined with inadequate social protection (insurance, relief), leaves households with no safety net.



B. The Consequences: Direct Barriers to HIV Care and Prevention

Barriers to Treatment Adherence (HIV Service Disruption):

Access & Logistics: Long distances to ART centers, unaffordable transport, and loss of medication during disasters.

Clinic Experience: Overcrowding, short consultation times, and perceived inadequate care for comorbidities reduce trust and motivation.

Economic & Social Stress: Financial constraints reduce food intake (essential for ART), while work schedules and gender roles conflict with clinic visits.

Psychological & Behavioral: Skipped doses due to discomfort, distrust in medicine, and the overwhelming impact of community stigma.

C. The Vicious Cycle: How Barriers Reinforce Each Other

1. A flood (Climate Factor) destroys a family's crops (Economic Factor).
2. This loss of income makes transport to the clinic unaffordable (Adherence Barrier), leading to missed appointments and interrupted treatment.
3. Interrupted treatment can lead to a higher viral load, which, combined with inconsistent condom use due to cost or shame (Prevention Barrier), increases the risk of HIV and STI transmission.
4. Flood may affect the condom procurement process of health worker making outreach difficult, further limiting access to prevention tools.
5. The resulting poor health and potential seroconversion of a partner deepen stigma (Social Factor) and increase financial strain, making the household even more vulnerable to the next climate shock.

Addressing Health Service Disruptions Due to Recurrent Natural Disasters: A Call for Policy-Level Preparedness

Our findings underscore the need for a more robust and proactive approach to health service continuity in disaster-prone areas. For instance, in Ghatal, West Bengal, annual floods are a known occurrence. While the community has adapted locally to regular flooding, the situation becomes especially challenging during years of unusually heavy floods. These events disrupt not only health service delivery but also essential aspects of life, including employment, food supply, and access to HIV / AIDS-related treatment.

Similarly, in Darjeeling, frequent landslides pose a significant barrier to accessing healthcare. During such times, patients — especially those with chronic conditions or in need of regular treatment — face extreme difficulty in reaching health facilities.

While some community-level preparedness is evident, particularly from individuals and households familiar with the risks, these efforts remain largely fragmented and insufficient in the face of large-scale disasters. Our study also identified several comorbidities among the affected population, which compounds the health burden during such crises.

Decentralizing services has its own problem, though some ART services are made available near residence of PLHIV particularly through Link ART Centres at remote places (Kakdwip near Sunderbans), but due to stigma and fear of identification PLHIVs become hesitant to avail the services from their locality. They prefer to come to their registered ART centre at far from residence but due to flood and other climate disaster, commuting becomes a challenge.

This highlights the urgent need for following policy recommendations:

- Policy-level disaster preparedness that explicitly incorporates health service continuity. Overall a climate resilient, inclusive, holistic HIV / STI / NCD care services is highly recommended and is aligned with Sustainable Development Goal. (SDG)
- Multi-sectoral collaboration among health, transport, disaster management, and local governance bodies. Collaboration with NPCCHH is recognized as an immediate requirement
- Pre-positioning of essential medicines and mobile health units in vulnerable areas. Local level adaptations can be leveraged into a system driven approach.
- Decentralized care models that allow for local delivery of essential services during emergencies. However stigma related issues needs to be adequately addressed, may be following mainstreaming of health care for multimorbidity during adverse situations.

Building disaster-resilient health systems is not just a reactive need but a strategic priority for ensuring uninterrupted care, especially for vulnerable populations.

Variations in key demographic profiles (or characteristics) of the sampled PLHIVs across different geo-climatic zones

1. Demographic characteristics by four geo-climatic zones (N=400, 100 for each zone)

Variable	Flood-prone	Hilly	Coastal	Temperate
Age (years)	Mean = 45.2 Median =39.8 IQR (28–42)	Mean = 43.2 Median =41 IQR (30–45)	Mean = 40.2 Median =38.9 IQR (25–40)	Mean = 40.5 Median =42.2 IQR (27–40)
Gender	Male: 53% Female: 47%	Male: 46% Female: 54%	Male: 48%, Female: 52%	Male: 35% Female: 61% TG: 1%
Marital Status	Married: 83%, Widow/er: 12%	Married: 57%, Widow/er: 21%	Married: 63% Widow/er: 15%	Married: 56%, Widow/er: 17%
Education	No Ed: 40%, Primary: 25%	No Ed: 29%, Primary: 22%	No Ed: 28%, Primary: 30%	No Ed: 18%, Primary: 22%
Occupation	Farm/Labour: 50%, Housewife: 25%	Business: 18.4%, Labour: 15.3%	Farmer/Labour: 42.4% Housewife: 27.3%	Housewife: 28%, Labour: 18%
Per capita Income (₹/month)	Mean ₹.3,200 (SD = ₹.2,500) Median = ₹.2800 IQR (₹.2000-3600)	Mean ₹.4,250 (SD = ₹.5,200) Median = ₹. 3900 IQR (₹.3500-6600)	Mean ₹.7,200 (SD = ₹.4,500) Median = ₹. 5500 IQR (₹. 3400-6200)	Mean ₹.10,450 (SD = ₹.8,200) Median = ₹. 6900 IQR (₹. 4800-9400)
Residence	Rural: 85% Urban: 15%	Rural: 84% Urban: 16%	Rural: 100%	Rural: 13% Urban: 87%

2. Table showing comorbidity pattern among PLHIVs across four geo- climatic regions (N=400, 100 for each zone)

Regions	Prediabetic (%)	Diabetic (%)	Hypothyroidism (%)	Anemic (%)
Temperate	24.3	6.7	6.7	24.3
Flood-prone	23	5	6	18
Coastal	12.9	6.4	3.2	22.5
Hilly	42.3	8.9	12.8	14.1

3. HIV-Related Information

Variable	Flood-prone	Hilly	Coastal	Temperate
Transmission Mode	Hetero: 96% MTCT: 1.7%	Hetero: 93.9%, MTCT: 2 Blood: 5%	Hetero: 87.9% MTCT: 2 Blood: 2.5%	Hetero: 85% MTCT: 10% Blood: 5%
ART Adherence (%)	90%	85.9%	78.8%	95%
Last CD4 Count <500	36%	38%	26%	13%

4. Climate Impact & Healthcare Access

Variable	Flood-prone	Hilly	Coastal	Temperate
Major Hazards perceived	Floods: 60% Storms: 25%	Flash Floods / Rainfall related event: 56.1% Landslides: 18.4%	Flood: 51% Storm: 17% Cyclone: 11.8%	Extreme Rainfall: 4% Storm: 3%
Disruption to Healthcare Reported	30%	38%	26%	13%

HIV Care and Climate: Key Findings

Regional Health Disparities

Comorbidity in PLHIV varies across regions particularly high prevalence of diabetic, prediabetic and hypothyroid were observed in hilly region. This requires further investigations.

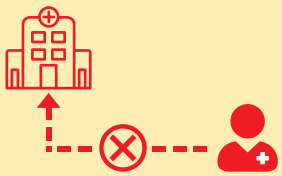
Climate Impact Access

Access to care is differentially affected by Climate Events

Local Adaptation vs Policy Need

Local level adaptation and preparedness measures are seen in flood prone area however any climate sensitive HIV care policy is yet to be in place.

Decentralization vs Stigma



Decentralization of ART services to LAC is beneficial during climatic event however due to stigma PLHIVs prefer to take ART from distant centers.

Climate-resilient HIV / STI Care Recommended Action Points

Holistic and Climate-sensitive HIV / STI Care

There is need for holistic, inclusive climate sensitive HIV care policies convergent with NPCCHH to ensure uniform preparedness and adaptation plan.

Geographically Prevalent Comorbidities and HIV

Different geographically prevalent comorbidities affecting HIV care needs to be addressed. Routine Testing of HbA1C and TSH at least on annual basis in hilly region may be considered in the program. A pilot initiative is recommended.

Decentralized Service and Stigma Mitigation

Decentralized service delivery during acute climate event may be ensured through pre planned mechanism to ensure uninterrupted access however stigma related issues needs to be taken care of simultaneously.

Acknowledgement:

We sincerely acknowledge the staff of the various ART centres for their invaluable contribution to the study (MCH, MR Bangur, Ghatal SDH, NBMCH, Darjeeling ART Centre)

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