



Aware but Unprepared

The Impact of Climate Change on Healthcare Workers
and Service Delivery in Africa

A Scoping Review

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Why This Matters Now



The Frontline Reality

A nurse in rural Uganda watches malaria cases appear in highland regions where they have never been seen before.

A physician in Egypt treats a surge of heat-related illness in a hospital with no air conditioning.

A midwife in Burkina Faso struggles to manage heat impacts on pregnant women without training on how to diagnose them.



Africa's Climate-Health Burden

Most vulnerable continent

Limited adaptive capacity and fragile health systems

Rising climate-sensitive diseases

Malaria, dengue, diarrhoeal diseases, respiratory illness, malnutrition, heat-related conditions

Overstretched health systems

Workforce shortages, brain drain, weak infrastructure, growing demand

Healthcare workers see this crisis building — but are they prepared to respond?

What This Review Set Out to Examine



Knowledge & Perceptions

How do healthcare workers in Africa understand and perceive the health impacts of climate change?



Service Delivery

How does climate change influence healthcare delivery and patient care across the continent?



Preparedness

Are health systems and healthcare workers adequately prepared to respond to climate-related health challenges?



Evidence Gaps

What research gaps exist to guide future policy, training, and investment?

Study Design & Methods

Scoping Review Approach

Framework: Joanna Briggs Institute (JBI)

Reporting: PRISMA-ScR guidelines

Question structure: Population–Concept–Context

Population

Healthcare workers of all cadres in Africa

Concept

Impacts of climate change and climate-related hazards on health service delivery and HCW well-being

Context

Health systems across all African regions

Search Strategy

Six electronic databases:

Scopus • PubMed • Web of Science • CINAHL • Dimensions • Google Scholar

Additional sources:

African Journal Online • Organisational websites • Hand searching

Inclusion criteria:

Primary research • Published 2005–2025 • Conducted in Africa • English language • Focus on HCWs and climate change

Analysis:

Content thematic analysis with iterative, inductive approach

Guiding Framework & Data Analysis



WHO Operational Framework for Climate Resilient Health Systems (WHO, 2023)

Data Analysis Approach

Content Thematic Analysis

1 Iterative, Inductive Approach

Charted data were analysed using content thematic analysis to understand climate change impacts on the health workforce and service delivery.

2 Concept & Theme Identification

Concepts and emergent themes were identified through iterative coding, discussed and refined collaboratively by the research team.

3 Team-Based Refinement

Characteristic themes were determined through team discussion, ensuring rigour and consensus across all reviewers.

4 PCC-Guided Synthesis

Findings were structured around the Population–Concept–Context framework, mapping evidence across HCW perceptions, service delivery, and system preparedness.

Study Selection

685

Records identified

665 from databases + 20 from other sources

517

Unique records screened

168 duplicates removed

81

Full texts assessed

263 excluded at title/abstract screening

18

Studies included

63 excluded (wrong outcomes, not primary, wrong design, etc.)

17 African countries • 10 quantitative, 5 qualitative, 3 mixed-methods • All published 2019–2025

Six Themes Emerged



HCWs Recognise Climate Impacts

13 studies



Increasing Patient Loads

9 studies



Unprepared Health Systems

10 studies



Mental Health Impacts on Workforce

5 studies



Knowledge & Training Gaps

15 studies



Policy & Resource Deficits

6 studies



Theme 1 Healthcare Workers Recognise Climate Impacts

13 of 18 studies found that HCWs across Africa recognise the rising health impacts of climate change — but the depth of understanding varies significantly.

Ghana, Nigeria, S. Africa, Namibia, Ethiopia, Kenya

Multi-country study: health professionals recognised increasing malaria and climate-sensitive diseases across all six countries (Opoku et al. 2021)

South Africa

Nurses linked rising temperatures to Listeria outbreaks, respiratory illness, and water scarcity (Manga et al. 2022)

Uganda

Health workers reported malaria cases appearing in highland regions due to changing rainfall patterns (Siya et al. 2025)

Zimbabwe

Drought conditions linked to worsening malnutrition in vulnerable communities (Sithole et al. 2021)

Egypt

Majority of nurses did NOT perceive a connection between climate change and community health; physicians lacked confidence discussing it with patients (Abdelaziz et al. 2024; Momen et al. 2024)

Awareness is widespread but uneven AND often too shallow to translate into clinical practice.

Theme 2 Climate Change Is Straining Service Delivery

9 of 18 studies documented growing pressures on patient care and health service delivery from climate-related events.



Access Disrupted

Flooding in Uganda destroyed roads and prevented patients from reaching health facilities

Uganda

Demand Surging

Physicians reported increasing cases of dehydration, allergies, and heat-related illness overwhelming services

Egypt

Maternal Health at Risk

Healthcare providers struggled to manage heat-related conditions among pregnant women without adequate knowledge

Burkina Faso

Workforce Drain

Strain on health services was associated with loss of HCWs through migration and brain drain, further reducing capacity

South Africa



Theme 3 Unprepared Health Systems at Facility Level

10 of 18 studies highlighted that health facilities lack the infrastructure and resources needed to respond to climate-driven challenges.

What HCWs reported across 10 countries:

- ▶ Insufficient space for isolating patients during disease surges
- ▶ No air conditioning or cooling systems in facilities experiencing extreme heat
- ▶ No or limited running water for infection control and cleanliness
- ▶ Shortage of doctors, dieticians, and psychologists to manage climate-sensitive patients
- ▶ Inadequate nutrition surveillance systems during drought periods
- ▶ No planned emergency resources for displaced populations
- ▶ Environmental health practitioners available but rarely utilised

Even where workers are aware, the systems around them cannot respond.



Theme 4 **Mental Health Impacts on the Workforce**

5 of 18 studies addressed the psychological toll on healthcare workers — a critical but underexplored dimension.

Egypt

Climate anxiety among nursing staff was prevalent and linked to reduced emotional wellbeing and job engagement. Nurses highlighted the need for interventions to address climate anxiety.

Atta et al. 2024

South Africa & Multi-country

Healthcare workers reported burnout and emotional stress, particularly those facing increased workloads, working in under-resourced settings, or caring for refugees and displaced populations.

Manga et al. 2022, Steerens et al. 2021

Ghana

Public health professionals expressed doubts about their ability to handle the mental and emotional demands of climate-related health emergencies, particularly in under-resourced settings.

Hussey et al. 2020

Only 5 of 18 studies explored this theme — the mental health burden on Africa's health workforce in climate contexts is severely under-researched.

Theme 5 Knowledge & Training Gaps

15 of 18 studies — the most frequently identified theme. Healthcare workers lack the training and knowledge to respond effectively.

Rwanda

Nurses and midwives showed low awareness of the association between climate change and neonatal health risks

Nsengiyumva et al. 2020

Burkina Faso

Healthcare workers misdiagnosed heat-related skin conditions in pregnant women; services showed limited understanding of heat implications during pregnancy

Kadio et al. 2024

Egypt

Physicians acknowledged climate impacts but only 17% felt confident discussing climate change with patients; most did not apply climate knowledge in daily practice

Momen et al. 2024; Mousa et al. 2024

Egypt

Over half of nurses believed they had no personal role in addressing climate change, viewing it as the duty of organisations and national leaders

Mahmoud et al. 2023

Namibia

Healthcare professionals recognised health impacts of climate change and were willing to act, but few worked in settings with sustainability policies or training

Lister et al. 2025

HCWs focus on treating illness rather than recognising how climate change is reshaping community health patterns.

Theme 6 Policy & Resource Deficits

6 of 18 studies highlighted the lack of comprehensive climate-health policies and insufficient resources at the health sector level.

Key Findings

- ▶ Healthcare facilities in South Africa lacked formal climate-health policies
- ▶ Radiographers in Ghana called for sustainability training and clear guidelines
- ▶ Weak surveillance and early warning systems left health systems reactive rather than proactive
- ▶ Many HCWs had little to no knowledge of climate-health policies at facility level
- ▶ Policy gaps hindered resource coordination and quality health service delivery

21

African countries have developed
Health National Adaptation Plans

Many are less than 5 years old. National
surveillance systems do not integrate
environmental data.

Conceptual Framework: How It All Connects





Summary: The Evidence Tells a Consistent Story

13/18

studies show HCWs recognise climate-health impacts — but recognition is uneven and often shallow

15/18

studies identified significant knowledge and training gaps — the most frequently reported finding

10/18

studies found health facilities unprepared — lacking infrastructure, resources, and climate-response strategies

9/18

studies documented rising patient loads and strained service delivery from climate events

5/18

studies addressed mental health impacts — burnout, anxiety, and emotional strain among HCWs

6/18

studies highlighted policy and resource deficits that leave health systems reactive, not proactive

18 studies across 17 African countries tell the same story: aware but unprepared.



Discussion : The State of the Evidence

A very young and thin evidence base for a crisis of this scale

Despite searching back to 2005, all 18 included studies were published between 2019 and 2025. Only 18 primary studies exist across the entire continent — from 17 out of 54 African countries. Most research to date has focused on disease outcomes rather than on the people delivering care.

Global patterns, African severity

Similar awareness-preparedness gaps have been reported among HCWs in high-income countries. However, the resource constraints in Africa — workforce shortages, infrastructure deficits, brain drain — make the consequences far more severe. The gap between what workers know and what they can do is wider in Africa than anywhere else.

Consistent findings across diverse settings

Whether in Egypt, Uganda, Ghana, South Africa, or Burkina Faso, the pattern repeats: healthcare workers are aware of climate impacts, but lack the training, resources, policies, and support to act. This consistency across diverse contexts strengthens the evidence despite the small number of studies.



Discussion: Closing the Knowledge-Action Gap

The Problem

Knowledge-action gap was the dominant finding (15/18 studies)

HCWs misdiagnose heat-related conditions (Burkina Faso)

Nurses unaware of climate-neonatal links (Rwanda)

Physicians lack confidence discussing climate with patients (Egypt)

Over half of nurses believe they have no personal role in addressing climate change (Egypt)

Few HCWs familiar with guidelines integrating climate into practice

What Must Change

Embed climate-health content into curricula

From nursing schools to continuing professional development

Move beyond lecture-and-learn models

Problem-based learning, clinical rotations, real-time drills

Build on what works

Experienced nurses were better equipped to respond — structured learning pathways make a difference

Use WHO guidance tools

WHO communication toolkit helps HCWs convey climate-health risks effectively

Discussion : Building Climate-Resilient Health Systems



01

Climate-Ready Infrastructure

Cooling systems, reliable water and energy supplies, surge capacity, improved facilities for increased patient loads

02

Integrated Disease Surveillance

Link environmental data with health data for early warning. Current systems do not integrate environmental monitoring

03

National Climate-Health Policies

Move health adaptation plans from paper to practice, with clear roles for HCWs at every governance level

04

Mental Health & Workforce Support

Integrate mental health support into welfare programs. Recognise climate-related burnout and build resilience

05

Innovation & Investment

Telemedicine, big data for predictive planning, increased government investment in infrastructure and disaster response

Discussion : Limitations & Research Priorities



Limitations

- ▶ Only 18 studies from 17 of 54 African countries
- ▶ Small sample sizes in many included studies
- ▶ Grey literature, non-English sources excluded
- ▶ Stakeholder consultation (JBI Stage 6) not conducted
- ▶ Limited causal attributions possible from cross-sectional designs

Research Priorities

- ▶ Intervention studies — test solutions, not just describe problems
- ▶ Longitudinal research — track how climate impacts evolve over time
- ▶ Mental health of HCWs — severely under-researched in Africa
- ▶ Studies from under-represented regions (Central, North, West Africa)
- ▶ Mixed-methods designs integrating qualitative depth with quantitative scale

Key Takeaways

1

Africa's healthcare workers are aware of the growing health threats from climate change — but awareness alone is not enough.

2

Health systems across the continent remain largely unprepared: inadequate training, weak infrastructure, workforce shortages, and limited policies.

3

The knowledge-action gap is the most urgent challenge. HCWs need training, clear roles, and tools to translate awareness into effective response.

4

The mental health burden on HCWs is real but severely under-researched. Support systems must be built into workforce planning.

5

Building climate-resilient health systems requires integrated action: training, infrastructure, surveillance, policy, and mental health support.



Aware but Unprepared

The evidence is clear. The time for action is now.

Thank You — Questions & Discussion



Questions & Discussion

Training • Infrastructure • Policy • Surveillance • Mental Health Support