



In Search of Better Health

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PRESS RELEASE

KEMRI Scientists Demonstrate Breakthrough in Low-Cost Housing Solutions for Heat Relief and Malaria Prevention

NAIROBI, KENYA – MONDAY, 5th January 2026: Scientists from the Kenya Medical Research Institute (KEMRI) have unveiled a major public-health and climate-adaptation breakthrough, demonstrating that simple, low-cost housing modifications can significantly cool homes and prevent malaria-carrying mosquitoes from entering, offering a scalable solution for millions of households across malaria-endemic Africa.

The findings, published today in the prestigious journal *Nature Medicine*, show that electricity-free housing improvements reduced indoor heat by up to 3.3°C and cut malaria-mosquito populations by as much as 77 percent in rural western Kenya, where communities face the dual burden of rising temperatures and persistent malaria transmission.

As climate change accelerates and malaria cases rebound globally estimated at 94 percent of cases and 95 percent of deaths occurring in Sub-Saharan Africa, this study provides compelling evidence that healthy housing design can function as both climate adaptation and disease prevention.

“This is exactly the kind of science Africa needs, a practical, locally grounded, and immediately actionable,” said KEMRI’s Ag. Director General, Prof. Elijah Songok. ***“These findings show that by rethinking how we build our homes, we can protect families from the health threats of climate change while strengthening malaria control. This research provides a clear pathway for policy, investment, and large-scale implementation.”***

“Housing is at the centre of today’s greatest challenges: climate, health, gender equality, and urban growth. This breakthrough denominates that Habitat for Humanity catalyse inclusive housing markets that serve everyone, especially the most vulnerable scaling proven solutions that benefit millions more,” Roland Pearson Vice President and Executive Director.

“Our research proves that we don’t need expensive technology to dramatically improve health outcomes,” said Dr. Bernard Abong’o, lead researcher at KEMRI’s Centre for Global Health Research. ***“With materials that are affordable and locally available, we can create homes that stay cooler and keep mosquitoes out. In effect, we have shown that it is possible to have a bed net for the entire house.”***

For decades, malaria control has relied heavily on bed nets and indoor spraying, promoted in Kenya under the slogan *“Sisi ndani, mbu nje* (people inside, mosquitoes out)”. While effective during sleep, these tools do not prevent mosquitoes from entering houses or address growing heat stress driven by climate change.

KEMRI scientists asked a transformative question: Can an entire house function like a bed net, keeping mosquitoes out while remaining naturally cool?

To answer this, researchers conducted a pilot randomized controlled study involving 40 households in Siaya County, testing four housing approaches: reflective cool roofs, cross-ventilation improvements, locally made mat ceilings, and unmodified control houses. All intervention homes were fully screened at doors, windows, and eaves to block mosquito entry.

The study found that cool-roof technology, using white reflective paint on metal roofs, delivered the strongest results, reducing daytime indoor heat by 3.3°C and night-time temperatures by 2.4°C. Mat ceilings provided moderate cooling, while cross-ventilation alone showed limited impact due to inconsistent window-opening practices.

Crucially, house screening reduced female *Anopheles funestus* mosquitoes, the primary malaria vectors, by 77 percent, alongside a 58 percent reduction in *Culex* mosquitoes, confirming that mosquito-proofing and thermal comfort can be achieved simultaneously.

Community response was strong, with 85 percent of households expressing willingness to invest their own resources to adopt and sustain the modifications, highlighting the feasibility and long-term sustainability of the approach.

The findings arrive at a critical moment for Africa's public-health and climate agenda. Rising temperatures increase heat-related illness and disrupt sleep, while malaria continues to impose heavy social and economic costs through healthcare expenses, lost productivity, and missed school days.

By combining passive cooling with vector control, the study marks a paradigm shift from treating disease to designing health into homes, using solutions that are low-carbon, scalable, and rooted in local contexts.

KEMRI is calling for urgent multisectoral action to translate the findings into widespread impact. The Institute urges national and county governments to integrate cool-roof and screening standards into building codes, malaria strategic plans, and climate adaptation policies, beginning in high-burden regions.

Development partners including the World Health Organization, Global Fund, UN-Habitat, World Bank, and African Development Bank are encouraged to support scale-up as part of integrated malaria control and climate-resilience investments.

The research was led by KEMRI in collaboration with the Liverpool School of Tropical Medicine (UK), Charité – Universitätsmedizin Berlin (Germany), Università degli Studi di Milano (Italy), and Habitat for Humanity International, which supported community-level implementation.

Funding was provided by the Wellcome Trust and SeaFreight Labs, underscoring the growing recognition that housing is a frontline public-health intervention.

Building on these results, KEMRI is now leading a large cluster-randomized controlled trial in Siaya and Kwale counties to assess long-term health, economic, and climate benefits, alongside national policy engagement on healthy housing standards.

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About KEMRI:

The Kenya Medical Research Institute (KEMRI) is a State Corporation established in Kenya in 1979 through the Science and Technology (Repealed) Act, Cap 250 of the Laws of Kenya operated under the Science Technology and Innovation Act, 2013 as the national body responsible for carrying out research in human health in Kenya. Currently, KEMRI operates under Legal Notice No. 35 of March 2021. KEMRI has grown from its humble beginning over 40 years ago to become a regional leader in human health research. The Institute currently ranks as one of the leading Centres of excellence in health research both in Africa as well as globally.