

Commentary

Malaria Ends with Us — Time to Reinvest, Reimagine, and Reignite

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ABSTRACT

On World Malaria Day 2025 under the banner “Malaria Ends with Us”, China’s experience offers timely lessons for global malaria elimination. Certified malaria-free in 2021, China achieved this milestone through decades of reinvestment, local innovation, and strong political will. This commentary highlights key strategies: reinvestment after resurgence in the Huai River Basin, adaptive local leadership in Hainan, and cross-border collaboration in Yunnan. China’s integrated approach — combining ecological vector control, community engagement, and sustained surveillance — shows that ending malaria requires more than technology. It demands long-term commitment, innovation, and collective action.

In 2021, China was certified malaria-free by the World Health Organization — a historic milestone and a testament to over 70 years of unrelenting public health commitment (1). Yet the global picture remains daunting: malaria remains endemic in more than 80 countries, with approximately 244 million cases and nearly 700,000 deaths in 2022, the vast majority from *Plasmodium falciparum* in Africa (2). On World Malaria Day 2025, the imperative is clear: we must reinvest in proven strategies, reimagine our response for a changing world, and reignite political and scientific will to finish the job. China’s experience offers a roadmap — and a warning pertinent to these times (3).

Reinvest: The Cost of Complacency

China’s malaria elimination was not linear. As the case of the Huai River Basin (HRB) demonstrates, early success can invite complacency. After achieving “basic elimination” by 1987, the HRB experienced a severe resurgence between 2003 and 2006. The causes were telling: dramatic reductions in funding,

dismantled surveillance infrastructure, loss of trained personnel, and underestimation of the transmission potential of *Anopheles sinensis* — a mosquito species thought to be low-risk (4).

Reinvestment turned the tide. Mass drug administration campaigns, vector control using *Bacillus sphaericus*, and a revitalized public health network restored elimination by 2012. The lesson is clear: malaria resurgence was not a failure of tools, but of sustained commitment. It is a lesson that has been reinforced repeatedly in many other global settings (5). Endemic and recently certified countries alike must plan now for the decades ahead. That means financial reinvestment, but also political leadership, workforce development, and robust surveillance systems that remain vigilant even when cases dwindle.

Reimagine: Innovations in Vector Control

While insecticide-treated nets (ITNs) and indoor residual spraying (IRS) have been global mainstays, China’s experience demonstrates the value of reimagining vector control. Environmental management — particularly larval source management — played a critical role in China’s success (6).

In agricultural regions, innovative irrigation and cropping practices — including intermittent irrigation, paddy-upland crop rotation, and rice-fish co-culture — effectively reduced *Anopheles* breeding sites while simultaneously improving agricultural yields and water use efficiency. These strategies proved cost-effective, scalable, and particularly relevant for low- and middle-income countries where vector control budgets face increasing constraints.

Biolarvicides such as *B. thuringiensis israelensis* and *B. sphaericus* have further expanded the vector control toolkit, offering targeted, environmentally friendly interventions. When combined with improved residential hygiene and infrastructure development, these measures provide sustainable and community-led approaches to malaria prevention.

Vector control, in short, need not be limited to

insecticide-treated surfaces. It can be designed into landscapes, livelihoods, and local economies — by reimagining the environments in which mosquitoes thrive.

Reignite: The Power of Local Leadership and Cross-border Collaboration

Elimination requires passion as much as precision (7). China's national campaign to eliminate the “four pests” — mosquitoes, flies, rats, and cockroaches — mobilized communities, trained tens of thousands of health workers, and drove a health literacy movement that reached every province (8). These efforts extended beyond top-down mandates to encompass cross-sectoral action and local accountability.

Through strong local government leadership and interdepartmental cooperation, Hainan established flexible, adaptive strategies for malaria control. Leadership continuously refined intervention methods across different phases of the elimination campaign (9). Hainan's approach offers valuable insights for regions with high malaria transmission risk.

Yunnan Province, China's final frontier for indigenous transmission, exemplified the power of tailored responses in complex border settings. Facing multiple vector species, challenging terrain, and shared borders with Myanmar, Laos, and Vietnam, Yunnan confronted substantial risk of imported cases. The province implemented stratified risk management, the now-famous “1-3-7” strategy (case reporting within 1 day, investigation within 3 days, focused response within 7 days), and extensive cross-border sentinel surveillance (10). Today, it stands as a global model for malaria elimination in high-mobility, cross-border settings.

Sustained elimination also requires new regional partnerships. China's cooperation with neighboring countries to monitor vectors, share data, and harmonize interventions demonstrates that malaria cannot be eliminated one country at a time. Cross-border frameworks must be reinvigorated, particularly in sub-Saharan Africa and the Greater Mekong Subregion.

Lessons for a Changing World

Climate change, urbanization, land-use shifts, and growing drug and insecticide resistance present evolving threats to malaria control. China's journey demonstrates that resilience lies in adaptability. Its phased strategy — transitioning from integrated

mosquito management to sustainable vector management — underscores the necessity for interventions that are locally tailored, environmentally attuned, and continuously evolving.

China's success against malaria resulted not from a single innovation but from the synergy of many factors: strong political will, stratified risk approaches, ecological insight, and relentless operational adaptation. As we approach 2030 — the target year for malaria elimination in multiple global strategies — we must integrate these lessons with next-generation tools: vaccines, genetic technologies, AI-driven surveillance, and climate-informed early warning systems.

Yet technology alone cannot end malaria. What remains essential is the human element: reinvestment in health systems, reimagined strategies for the most complex settings, and reignition of collective will.

A Call to Action

As we mark World Malaria Day under the banner “Malaria Ends with Us”, let us recognize that “us” encompasses national governments, local communities, scientists, funders, and every individual at risk. Ending malaria is possible — but only if we sustain what works, embrace innovation, and remain vigilant for emerging challenges. China's 70-year journey is not merely a triumph to be admired from afar. It is a playbook to be adapted, invested in, and reimagined — until malaria ends with all of us.

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