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The Evolving Face of Malaria - Elimination to Eradication

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Abstract

Malaria, one of humanity's oldest scourges, is undergoing a dramatic epidemiological and therapeutic transformation. Once defined by high transmission, limited diagnostics, and chloroquine-based therapy, the disease today faces a complex landscape of declining incidence in some regions, persistent hotspots, drug and insecticide resistance, and emerging climate-driven shifts. The global agenda has moved from control to elimination, with WHO's 2030 targets and several countries now malaria-free. India, accounting for the majority of cases in South-East Asia, has shown remarkable progress yet faces challenges from *Plasmodium falciparum* resistance, *P. vivax* relapses, urban malaria, and asymptomatic reservoirs.

This talk will map malaria's evolving face across three dimensions. First, **parasite and vector biology** - emergence of artemisinin partial resistance, *Pfhrp2/3* deletions compromising RDTs, and vector behavior changes undermining bed nets. Second, **innovation surge** - deployment of R21/Matrix-M and RTS,S vaccines, monoclonal antibodies, next-gen diagnostics, and gene-drive approaches for vector control. Third, **programmatic reality** - the "last mile" challenge of case-based surveillance, radical cure for *P. vivax*, and financing elimination in low-transmission settings. Indian data will illustrate regional heterogeneity, ICU burden of severe malaria, and practical treatment updates for clinicians.

The session concludes that eradication is biologically feasible but operationally formidable. Success will depend on integrating new tools with robust health systems, cross-border collaboration, and sustained political will. For clinicians, the message is clear: malaria is not disappearing, it is evolving. Diagnosis, treatment, and prevention strategies must evolve with it.