

Progress towards Malaria Elimination in India: Achievements till Now & Way Forward

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Introduction

Malaria, one of the oldest infectious disease affecting mankind, still continue to impose great health and societal burden with an estimated 3.2 billion people being at risk of its infection world wide¹. The Global Technical Strategy for Malaria 2016–30 by the World Health Organization (WHO), targets to eliminate malaria in at least ten countries by 2020, 20 countries by 2025, and 30 countries by 2030¹. As classified according to WHO regions, most of the malaria cases were estimated to be in African region (88%) followed by southeast region and eastern Mediterranean region¹. However, in Southeast Asia region only, about 1.4 billion people are reported to be at risk of malaria which is approximately half of the total population at risk worldwide².

India, the most populous country in the Southeast Asian region consisting of ten countries, is the most affected country in the region with more than 400 million people being at risk of malaria infection³. In the year 2014, it reported a total of 1.1 million malaria cases which accounted for approximately 75% of all malaria cases in the region.^{4,5} Around 20% (18.3 million) of the Indian population lives in high malaria transmission areas having prevalence of malaria more than one per 1000 population¹. Another contrasting feature is that 80% of malaria cases reported in the country are confined to regions where only 20% of the population resides—in tribal, hilly, hard-to-reach, or inaccessible areas^{5,6}. Further, Malaria control measures are inadequate in India. Less than 20% of the at-risk populations only are effectively protected by bednets and indoor residual spray, which is among the lowest in the Southeast Asian region.⁷ Investment in malaria control per capita (US\$0–1 per person) in India is one of the lowest globally,⁸ as is anti-malarial treatment. Even the reduction in incidence of malaria is among the smallest of all countries within the region. Surveillance system have been reported to be inadequate in India, and it has the highest number of suspected, unconfirmed of malaria cases in the world.^{3,6,9}

In line with the Global Technical Strategy for Malaria 2016–30 by WHO and Asia Pacific Leaders Malaria Alliance Malaria Elimination Roadmap for the Asia Pacific region, India has set the goal of malaria elimination by 2030¹. India shares land borders with several countries aiming for malaria elimination including Bhutan (by 2016), Bangladesh (by 2020), and Nepal (by 2026).^{10,11} Sri Lanka, which eliminated malaria in 2012,¹² is separated from India by only a small distance of sea, with frequent air travel occurring between the two countries. India has endorsed the goal of an Asia Pacific region free of malaria by 2030 and is participating in the work of the Asia Pacific Leaders Malaria Alliance. The slow gains made in India are likely to present a challenge to global and regional malaria elimination.

Historical context

In view of increasing malaria morbidity and mortality in late 90s, the Government of India sought and received \$165 million from the World Bank in 1997 to implement the 'Enhanced Malaria Control Project' in 100 high-risk districts of eight north Indian states. The Project was aimed with transition from earlier unsuccessful eradication strategy to

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more modern control methods. The widespread use of insecticide residual spraying was curtailed and instead restricted to only high-risk areas. It emphasized on full-scale implementation of early diagnosis and prompt treatment of cases both at facility and at village levels, introduction of insecticide-treated bed nets, and alternative vector control methods including environmental management and use of larvivorous fish. Due to its impact, the quality and completeness of malaria surveillance got improved and laboratory diagnostic capacity was expanded¹³. Malaria morbidity decreased by 43% in the targeted districts and nationwide by 38% with almost 1 million fewer cases diagnosed in year 2004 than in 1997.¹⁴At the same time, the population covered by insecticide residual spraying in the Project districts decreased by almost 50%.¹⁴As a result, some states have achieved very low incidence of malaria with the potential of achieving a state of malaria elimination in the near future¹⁵.With financial support from the Global Fund to Fight AIDS, Tuberculosis, and Malaria,intensified malaria control projects were started in the northeastern region from 2005 to 2010. The Global Fund supports extended through project round 9 for another 5 years (2010–15) to cover all 89 districts of seven northeastern region states¹⁶⁻¹⁷.

To promote synergies in prevention and control of different vector-borne diseases including Japanese encephalitis and dengue, the Malaria control programme was renamed as the National Vector Borne Disease Control Programme in 2003¹⁶.The main strategies pursued by the National Vector Borne Disease Control Programme(NVDCP) are: disease management through early case detection and complete treatment, integrated vector management to reduce the risk of vector-borne transmission, and supportive interventions including communicating behaviour change, capacity building, and monitoring and assessment of programmes^{18, 19}.

Regional having high burden of malaria

High malaria transmission regions in India can be broadly divided into eastern, central, and northeast regions. States outside these regions which report high malaria transmission are Gujarat, Rajasthan, and Goa in the west of India.²⁰The eastern region has an annual parasite incidence (API) of more than five per 1000 people.²¹Odisha state in the region accounts for a substantial proportion of the malaria burden in India. Jharkhand and Bihar are other malaria endemic states in the region that contribute about 12% of the total malaria cases.^{22,23} Other states, including West Bengal, also contribute considerably to the malaria burden.

Challenges of malaria elimination

Malaria elimination in India currently faces many challenges. These include resistance of commonly used antimalarial drugs. Different regions of India have different dominant

malaria vectors, exhibiting varying habitat and feeding choices. Insecticidal resistance to these vectors has been reported. Urban malaria also poses a substantial malaria burden fuelled as a result of unplanned expansion of cities. A complex health system of public and private providers adds to the socioeconomic and environmental factors to increase the complexities of malaria control and elimination in India²⁴. In India, the National Vector Borne Disease Control Programme is a vertically implemented nationwide programme²⁵. Health is the responsibility of the state; therefore, malaria control is primarily carried out by the states under the overall guidance of the programme²⁶The true burden of malaria in India is under-reported as a result of poor surveillance, inadequate collaboration between the private health sector and the government, and the inability to make accurate estimates of populations at risk²⁷. As a result, surveillance data are not useful for effective implementation of control and preventive activities against malaria²⁸. Other challenges include treatment on the basis of clinical diagnosis rather than microscopic diagnosis, often resulting in under diagnosis²⁹poor national coordination of programmes at state level, and insufficient political will, accountability, and governance.

Newer developments in malaria elimination

National Strategic Plan for Malaria Elimination (2017-22) was launched recently which gives year wise elimination targets in various parts of the country depending upon the endemicity of malaria in the next 5 years.³⁰ Encouraging results have been achieved in the North East India and efforts are now focused in other endemic states such as Jharkhand, Odisha, Chhattisgarh, Madhya Pradesh and Maharashtra. Since the past three years, focus is on Long Lasting Impregnated Nets (LLINs) for malaria control. The Ministry of Health & Family Welfare has distributed 14 million nets and 25 million nets are to be distributed in next 5 years.³⁰

Conclusion

In conclusion, Malaria elimination from India is uphill task due to its complex transmission, with varied geopolitical and socioeconomic factors affecting it. Vector control strategies have undergone many changes, but some states still continue with DDT as the main insecticide, despite reported resistance. The treatment of malaria has also changed to use of newer effective anti-malarial combinations. However, inadequate financial support is a key barrier to effective control measures in India. The health infrastructures are under-developed with poor malaria reporting systems leading to gross underreporting of the true malaria burden. Furthermore, a cross-border malaria strategy with the neighbouring countries is highly crucial to maintain and achieve the aims of malaria elimination in the region.

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