



## MALARIA: Keeping Up The Fight

ALEKH is a quarterly newsletter of the Centre of Excellence (CoE) for Knowledge Management in Health and Nutrition. The CoE has been established by the Ministry of Tribal Affairs, in collaboration with Piramal Swasthya Management.

The fifth volume of the newsletter is curated around Malaria, dedicated to spreading awareness, understanding interventions and innovations in the field to provide a unified scenario of Malaria in tribal populations. We appreciate the support from various experts, civil society organisations and development partners who have contributed to the making of this newsletter.

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## Pressing Issue of Malaria in India

*By Ministry of Health and Family Welfare*

Malaria is a major public health problem in India but is preventable and curable. Malaria interventions are highly cost-effective and demonstrate one of the highest returns on investment in public health. In countries where the disease is endemic, efforts to control and eliminate malaria are increasingly viewed as high-impact strategic investments that generate significant returns for public health, help to alleviate poverty, improve equity and contribute to overall development.

Over the years, the Malaria Programme of India has evolved from disease control to elimination. Encouraged by the success achieved in malaria control in over the recent years, the vision of India's malaria control programme has been shifted to sustained malaria elimination to contribute more effectively to improved health and quality of life of the people.

India has put persistent efforts to counter the endemic through integrated actions and implementation of accepted standards and tools aligned with consistent global initiatives. WHO projection showed an impact in terms of a decrease of 50–75% in the number of malaria cases by 2015 in India (relative to 2000 baseline), which showed that the country has been on track to decrease case incidence 2000–2015. Stressing on the need to enhance the integrated efforts, MoHFW has built on the progress and learning's from previous experiences to catalyse the eradication as well as elimination of Malaria.



*Photo Credits: Malaria No More*

In May 2015, the World Health Assembly has endorsed the Global Technical Strategy (GTS) for Malaria Elimination 2016-2030, which has laid down clear global goals and targets till 2030. In accordance with the GTS, National Vector Borne Disease Control Programme (NVBDCP) of the Ministry of Health and Family Welfare launched the National Framework for Malaria Elimination (NFME) 2016-2030 in February 2016.

The goal of NFME is to eliminate malaria throughout the entire country by 2030; and maintain malaria-free status in areas where malaria transmission has been interrupted and prevent re-introduction of malaria. The National Strategic Plan (NSP) for Malaria Elimination (2017-2022) has been developed based on the NFME with an aim of phased elimination of malaria in India. The NFME has interim goals and milestones, which are critical to being achieved through collaboration and coordination within the government system as well as with development partners.

After launch of NFME 2016-2030, the malaria disease burden in India has declined by 84% and malaria deaths by 76% in 2020 as compared to 2015. According to the World Malaria Report 2020, India is the only high endemic country which has reported a decline of 17.6% in 2019 as compared to 2018. India has also contributed to the largest drop in cases region-wide, from approximately 20 million to about 6 million. Just seven out of thirty-six States/UTs in the country accounted for 90% of the estimated cases in 2018. These states, together with other states in the north eastern part of India, have some parts of it being forest-like, hilly, tribal or conflict-affected and have historically had a large burden of malaria. Even in states with low levels of malaria transmission, most of the malaria cases are confined to areas that have the above-mentioned geographical or socio-political profiles.

MoH&FW with World Health Organization (WHO) has jointly focused on accelerating malaria elimination activities in the states as per National Strategic Plan with High Burden to High Impact (HBHI) strategy initiated in four high endemic states i.e. West Bengal, Jharkhand, Chhattisgarh and Madhya Pradesh. HBHI is the country-led response which is catalysed by WHO to the pace of progress in the global malaria fight.

With the current year's theme being "Reaching the Zero Malaria target", World Malaria Day was celebrated on 25th April 2021. Dr. Harsh Vardhan, Union Minister of Health and Family Welfare announced the successful reporting of zero malaria cases in 116 districts in the country. He further highlighted the efforts of health care workers who achieved a monumental feat of ensuring effective delivery of anti-malaria interventions during the pandemic. He also acknowledged the Chhattisgarh government for Malaria Mukta Abhiyan in the Bastar Region wherein 3.78 million people were screened for malaria.

To eliminate malaria from our country, it will need concerted action requiring long term commitment from multiple stakeholders. Acknowledging the need for convergent action, active community participation and inter-sectoral coordination, MoH&FW calls for action by all state governments to continue the fight and sustain the momentum even during the COVID-19 pandemic.

# FACTS ABOUT MALARIA



1

Malaria is a serious, sometimes fatal disease that is spread by mosquitoes carrying the parasite. The disease is spread when these mosquitoes feed on humans.

2

Malaria breeds mostly in warmer climates, where there is an abundance of humidity and rain.

3

Common symptoms of malaria are high fever, chills, headache, and other flu-like symptoms. Malaria is entirely preventable and treatable.

4

An infected person may start feeling symptoms anywhere from a week to a month after they are bitten.

5

Pregnant women are extremely vulnerable to malaria. If the disease is contracted during pregnancy, it can be passed to the infant or result in low birth weight, which decreases the baby's chance of survival.



## Interview Byte - Dr Sarthak Das

*Dr. Sarthak Das is Chief Executive Officer of the Communicable Disease Threats Initiative & Asia Pacific Leaders Malaria Alliance, and Adjunct Lecturer at the Harvard Chan School of Public Health. He has spent the last three decades living and working on infectious diseases, health systems in Africa and Asia Pacific.*

**Question 1: According to you, what are the major challenges for India to eliminate Malaria? Are the policies in India rightly aligned to eradicate it by the year 2030?**

Before getting to challenges, first it's important to highlight India's formidable progress towards malaria elimination - a 60% decline in 2019 compared to 2017 - this, at a time, when global progress against malaria plateaued.

The challenge for India remains in highly rural and remote areas, among tribal and border forest where access and health systems are often weak. Malaria also continues to be a disease of poverty and inequity, with the most vulnerable at the greatest risk of dying from malaria. Evidence indicates tribal communities account for 30% of all malaria cases and nearly 50% of all malaria deaths in the country. Compounding this is COVID-19 which continues to disrupt essential malaria surveillance and elimination efforts.

India has committed to eliminating malaria by 2030 and its strategies for malaria elimination in different endemic states of the country have been laid out in its National Framework for Malaria Elimination 2016-2030. As one of the countries with the highest burden of malaria in Asia Pacific, India has also incorporated the World Health Organization's (WHO) High-Burden to High-Impact (HBHI) approach to accelerate malaria elimination in high-burden geographies.

While the path to malaria elimination in India is achievable, several key factors can help ensure progress. Malaria is still not a notifiable disease throughout the country which fuels the lack of integration with the private sector and threatens the robustness of data on disease estimates. There are also issues related to the migration of infection across sub-national and national borders, the



lack of robust monitoring and evaluations systems, including limited digital data reporting systems and skilled human resources to support this, as highlighted in the National Strategic Plan for Malaria Elimination 2017-22. While the national malaria programme has taken steps to address many of these challenges by providing support to model malaria elimination projects at a sub-national level to replicate and sustain their learnings to other parts of the country, India must remain focused on strengthening the malaria response and broader health systems.

All these policies, learnings and efforts not only offer a significant opportunity to reduce malaria cases but will certainly help to strengthen the country's march towards a malaria-free India by 2030.

***Question 2: What are the learnings globally to counter the Malaria epidemic and what more can be done in India regarding that?***

Malaria is a health security crisis that places a huge strain on health systems, undermines economies and is devastating to families and communities. Since 2000, strong political commitment and effective interventions have drastically reduced the global burden of malaria. Since then, 40 countries from every region including Asia Pacific eliminated malaria, proving that elimination is possible.

Asia Pacific in particular has made tremendous progress over the last 10 years - malaria cases have more than halved and there is a staggering 89% less deaths from malaria. Despite the progress, 90% of the case burden remains in just five countries - India, Papua New Guinea, Indonesia, Pakistan and Afghanistan. With two and a half billion people in Asia Pacific still at risk and in some areas, with malaria cases rising, the elimination gains made in the region must not go to waste.

Experience from other countries, as well as local best practices, offer a number of learnings that could help India defeat malaria. For instance, China received its malaria-free certification earlier this year and highlighted the crucial role of cross-sector collaboration, political will, continued domestic financing, and targeted interventions for rural, high-risk and border areas. Other learnings include its success with the 1-3-7 strategy in particular - a process with strict timelines to report, investigate and respond to every case of malaria and to prevent the resurgence of malaria in the future - which has already been adopted and tailored to local settings by several countries in the Asia Pacific. Strong leadership and a whole of government approach to elimination, for example through a national elimination task force, have also helped to provide strategic oversight, maintain momentum and monitor progress towards this elimination goal. Consideration of these areas will be critical for India to truly end malaria.

Beyond China, the Greater Mekong subregion (GMS), where rising drug resistance threatened global progress against malaria, has seen significant advances in recent years (malaria cases fell by 90% between 2000 and 2019). Progress in the GMS to-date has largely been facilitated by a vast network of community health workers actively detecting and preventing malaria cases and strengthened surveillance.

India is working towards similar initiatives. Local bodies like panchayats and municipalities are aimed to facilitate and swiftly identify new hotspots of malaria for the district health department to resolve. In many parts of the country, ASHAs - India's first line of defence of female health worker, provide a critical link between the community and public health system - have been deployed to provide prevention education for several health issues, including dengue, malaria, and now COVID-19.

There are also recent learnings from malaria elimination demonstration projects in India which have delivered promising results in the high-endemic geographies of Mandla and Odisha. Key learnings highlight the importance of continuous staff training and capacity building particularly in the areas of disease surveillance, supply chain, vector control and case management. Accountability at management, operational, technical, and financial levels were also identified as areas that need attention. These partnership projects were able to reduce the malaria incidence by more than 90% and were able to maintain the same even during the worst phases of the COVID-19 pandemic.

***Question 3: Seeing the world being fixated to COVID-19 pandemic, are you hoping for elimination of Malaria across the world in the not-so-distant future?***

I remain hopeful. While we are indeed in the midst of the pandemic, our scientific understanding of COVID has vastly increased in less than 24 months; it seems we may be on a path to treating it as endemic in much of the world. In terms of malaria elimination in the not-so-distant future, the Lancet Commission on Malaria Eradication within a Generation 2019 has said it best as both 'achievable and necessary'. Malaria is a preventable and curable disease. Not only do we have the tools to stop its spread we have a historic opportunity to defeat it; we have eliminated in over 40 countries. While progress is uneven, Asia-Pacific is still on track to eliminate malaria in the region by 2030 but we have to remain steadfast. The next nine years are critical for high-burden countries in the region such as India. Increasing investments and commitments to build on the ground malaria and healthcare infrastructure is the quickest, most cost-effective solution to accelerate progress against malaria and address urgent health security challenges of today and in the future.

As has been said so often as this pandemic has unfolded, we are only as strong as our weakest link. The pandemic's silver lining is that it has given global leaders and health policymakers an extraordinary opportunity to build durable systems. Simply put, there has never been a more urgent time to invest in building strong health systems to see us through diseases of today and tomorrow.

For example, countries that invested in frontline malaria capacity and interventions - especially Community Health Workers - are now leveraging them effectively as part of their pandemic response. Last year alone, malaria control efforts prevented ~500 million fevers, and one million Community Health Workers equipped with malaria Rapid Diagnostic Tests diagnosed 267 million fevers. Seven of ten symptoms overlap between malaria and COVID-19, led by fever. This speaks to the importance of integrating the surveillance of malaria within the broader health system. From 40,000 Health Extension

Workers and an estimated three million Women's Development Army Volunteers in Ethiopia, 33,000 trained front line healthcare workers in Uganda, to one million Village Health Volunteers in Thailand - all are managing COVID-19 while continuing to provide effective malaria case management during the outbreak.

Malaria elimination should be a global goal and one in which we should remain firm in our commitment.

***Question 4: With the ongoing innovations related to technology in every arena, can we expect new tools and technological interventions related to Malaria in the coming years?***

After more than three decades of research and development, the global malaria community has in fact paved the way for a scientific breakthrough. The WHO recently recommended the widespread use of the world's first malaria vaccine, for young children in sub-Saharan Africa and other high burden regions, with moderate to high (*P. falciparum*) malaria. This is a huge milestone that complements our existing arsenal of tools to combat malaria, particularly for our most hard to reach and vulnerable populations.

In India, approximately 10% of malaria deaths are among young children under the age of five. While the vaccine's efficacy of 30% is modest, there is future potential for considerable impact among rural and remote populations, although further studies and considerations will be required to truly understand its benefits in Asia.

It is also important to be mindful that, accelerating progress towards ending malaria requires significantly increasing access to both existing, proven, and new malaria prevention interventions - from treated mosquito nets, insecticide spraying, early diagnosis and prompt treatment to the new malaria vaccine - all of which complement each other and will protect millions of people still at risk of this preventable disease. There really is no magic bullet or 'one size fits all' approach to ending malaria.

The vaccine will certainly play its part in tackling the *P. falciparum* strain of malaria; hopefully more science will emerge to understand its potential impact on *P. vivax*. In addition to the vaccine, we must also continue to scale up existing effective malaria interventions and tools and tailor them to the local context. Bed nets, other vector control measures, and anti-malarials are proven and tremendously effective. The availability of the new vaccine does however lay the foundation for next-generation innovations and provides additional tools for our arsenal as we strive towards defeating malaria.

We have made tremendous strides towards eliminating malaria in Asia Pacific. With continued political leadership, increased public and private funding to expand access to existing life-saving tools and the development and delivery of transformative tools, we will be the generation to end this huge historical scourge - in India and the rest of the world.



# Tribal Regions in India Need Special Attention to Achieve Malaria Elimination

By Prof. Balram Bhargava, Secretary, Department of Health Research and Director General, Indian Council of Medical Research (ICMR), New Delhi

## Background

Malaria continues to be a leading vector borne disease of public health importance in India and other developing countries. According to the World Malaria Report 2020, there were around 229 million estimated malaria cases and 409,000 deaths in 2019 globally. India is the only country in the WHO South-East Asia Region, which could achieve a decline in cases from about 20 million cases in 2000 to about 5.6 million in 2019.<sup>1</sup> National Vector Borne Disease Control Programme (NVBDCP) reported 0.33 million cases and 77 deaths in 2019. Reduction in malaria burden by 83.3% in malaria cases and 92% in deaths from year 2000 to 2019 was observed. Annual Parasitic Incidence (API) has been less than one since year 2012.<sup>2</sup>

At the same time, the epidemiological picture of malaria is quite heterogeneous in India. The majority (~88%) of malaria burden in 2019 was shouldered by 10 states of India viz., Chhattisgarh, Gujarat, Jharkhand, Madhya Pradesh, Maharashtra, Mizoram, Odisha, Tripura, Uttar Pradesh and West Bengal.<sup>3</sup>

## Tribal Population Affected by Malaria

The tribal or indigenous population constitute 8.6% of total population of India and more than 80% of these tribal people live in 10 states viz. Madhya Pradesh, Maharashtra, Odisha, Rajasthan, Gujarat, Jharkhand, Chhattisgarh, Andhra Pradesh, West Bengal and Karnataka.<sup>4</sup> States like Chhattisgarh, Jharkhand and Odisha reported the highest number of *P. falciparum* malaria in 2019.<sup>3</sup>

As per national malaria programme's National Strategic Plan (2017-2022), tribal dominated districts are characterised by having a tribal population 25% and Slide Positivity Rate of 1% or more. In 2012, out of total districts reporting malaria (620), ~ 25% districts were tribal districts.<sup>5</sup> These tribal districts reporting malaria are representing only 5% of country's population but disproportionately contributed 44% of country's total malaria cases, 68% of *falciparum* malaria and 43% of malaria deaths.<sup>5</sup>

## Stark Bottlenecks

Tribal communities typically live in remote and inaccessible areas owing to geographical situations like forest, hills, valleys and perennial water bodies. The presence of various malaria parasites (*P.falciparum* causing ~ 78% of total malaria cases in these areas) and diversity of mosquito vectors, climatic conditions conducive for parasite and vector growth and certain outdoor habits of tribal people lead to high malaria transmission of malaria in tribal areas.<sup>6</sup>

Unqualified practitioners and faith healers often are the first point of contact for these tribal communities which further delays the correct diagnosis and treatment and contribute to continued transmission. The tribal communities are further disadvantaged due to inadequate health care

infrastructure and their limited access. Acceptance of vector control interventions like indoor residual spray and insecticide treated bed nets can be variable in these communities. All these factors complicate the malaria transmission dynamics and also create barriers to timely healthcare seeking for malaria, as in for any acute febrile condition, due to availability and accessibility issues.

### Tackling the problem

There is a need to take concerted actions to tackle the above issues and empower the tribal communities not only in understanding malaria as a serious infection but also optimizing the use of interventions such as insecticide treated nets and indoor residual spray, etc. The National Strategic Plan (NSP; 2017-22) which provides a more practical approach and a way to assess the progress of the elimination programme, also addresses the problem of malaria in tribal dominated areas in the form of Tribal Malaria Action Plan (TMAP). It incorporates the objective to reduce the large reservoir of malaria parasite in tribal population through supporting surveillance by increasing outreach services through grassroots level workers, involvement of NGOs and civil society, strengthening of infrastructure especially primary health care centres, assist the referrals, ensuring provision of treated bed nets and indoor sprays.<sup>5</sup>



Malaria survey in tribal community in Mandla district, Jabalpur

### The Mandla Model

Accordingly, The Malaria Elimination Demonstration Project (MEDP), a public-private partnership initiative among the Foundation for Disease Elimination and Control of India (FDEC), Indian Council of Medical Research (ICMR) and Government of Madhya Pradesh, was initiated in 2017 in the tribal district of Mandla with a goal to develop a model for malaria elimination.<sup>7</sup> By employing methodologies, such as (1) robust surveillance and case management; (2) sentinel surveillance of cases treated by

private practitioners; (3) mass screening and treatment; (4) community and school-centric information education communication (IEC) and behaviour change communication (BCC); (5) capacity building; and (6) monitoring and supervision of vector control activities, (7) the end of the three-year project saw achievement of a 91% reduction in indigenous cases of malaria in the Mandla district of Madhya Pradesh.<sup>8</sup>

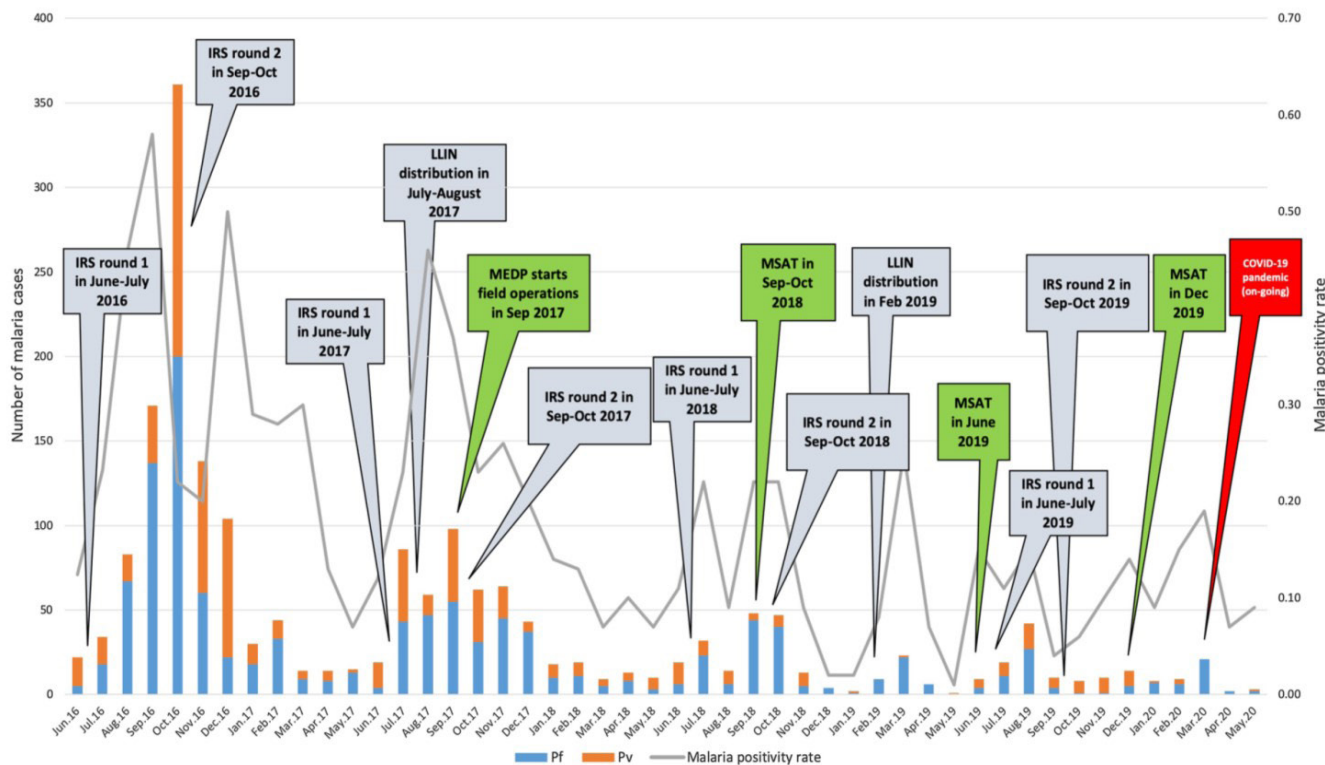


Fig. 1: Month-wise and species-wise malaria cases from June 2016 in Mandla district with major events in the timeline. These events include introduction of various vector control interventions, field operations by MEDP, mass screening and treatment.

(Source: Praveen K. Bharti et al. (2020). Demonstration of indigenous malaria elimination through Track-Test-Treat-Track (T4) strategy in a Malaria Elimination Demonstration Project in Mandla, Madhya Pradesh. *Malaria J*, 2020 (19);339)

## Conclusion

Considering malaria is one of the most highly prevalent diseases in tribes, such a model is of high relevance. Therefore, if India is to realise its dream of malaria elimination, it is imperative that tribal regions are taken into the fold and all possible strategies are applied to treat and prevent all malaria cases in the remotest corners of the country in an attempt towards reaching the unreached.

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# Smart Digital Surveillance in Accelerating Malaria Elimination in India

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## Global Scenario

Malaria is a protozoan parasitic infection caused by five species of the genus Plasmodium. Plasmodium vivax, P. falciparum, P. malariae, P. ovale and P. knowlesi. As per the Global Malaria Report 2020, India shared 2% of the total global malaria cases in 2019 and accounted for 88% of malaria cases and 86% of all malaria deaths in the World Health Organization (WHO) South- East Asia Region in 2019. It is the only country outside Africa among the world's 11 'high burden to high impact' countries (Fig 1)

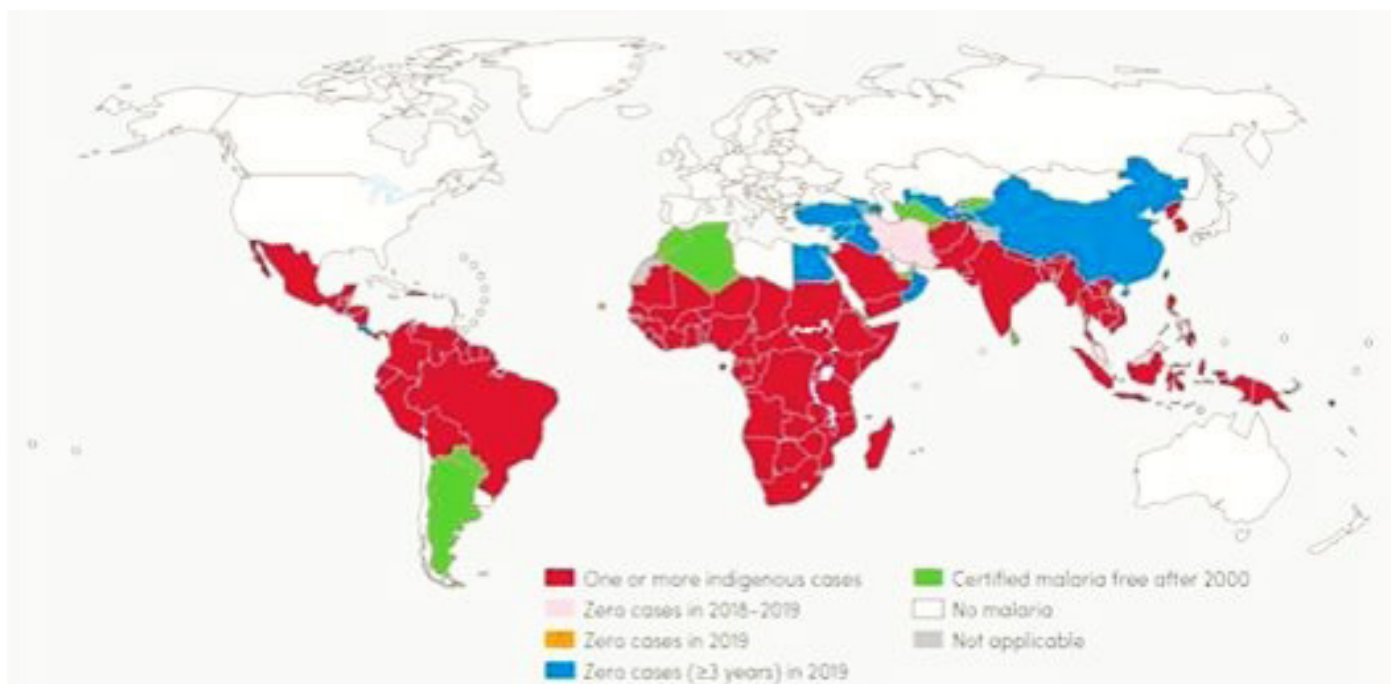
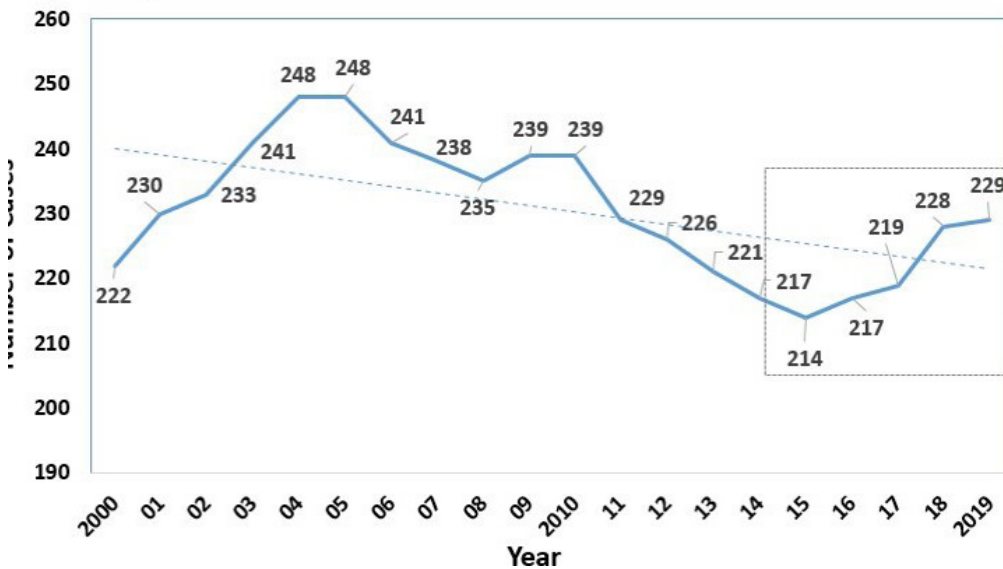


Figure 1: Global Malaria Burden. Countries with indigenous cases in 2000 and their status by 2019 (Source: WHO)

The global malaria burden has reduced significantly from 2000 to 2015 owing to introductions of long-lasting insecticidal nets (LLINs) for vector mosquitoes and Artemisinin-based Combination Therapy (ACT) for treating malaria. But there is an increase of malaria cases from 2015 (Fig 2) for which several factors are involved. However, since 1900, 127 countries have achieved malaria elimination. In 2021, El Salvador and China have registered this feat<sup>1</sup>.

### Global malaria cases, 2000-2019 (million)



### Global malaria cases contributed by countries 2019

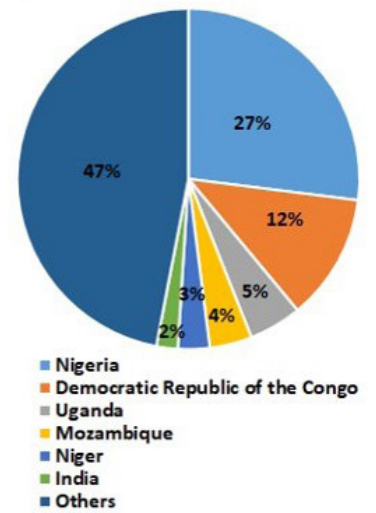


Figure 2: Trends of global malaria 2000 to 2019. Nigeria alone continues to contribute the majority of cases; in 2019 contributed 27% of total global malaria cases<sup>1</sup>.

### Indian perspectives

In February 2016, India launched National Framework for Malaria Elimination (NFME) 2016- 2030 aiming to eradicate malaria by 2030. This framework has been outlined with a vision to eliminate the disease from the country, aiming at improved health with quality of life and poverty alleviation. India continues to thrive on tremendous progress towards malaria elimination and is the only highly endemic country which has reported a decline of 17.6% of malaria cases in 2019 as compared to 2018.

As per the NFME, all the 36 states/UTs have been classified based on Annual Parasite Incidence (API) i.e. cases per 1000 population. Category 0: prevention of re-establishment of cases. Category 1: Elimination phase - 15 states/UTs reporting <1 API population at risk. Category 2: Pre- elimination phase - 11 states/UTs reporting <1 API population at risk, but some districts reporting an API 1 at risk or above. Category 3: Intensified control phase - 10 states/UTs reporting API 1 at risk or above. This means indigenous transmissions have to cease between 2027 to 2029 and achieve ultimate certification by 2030. But there are multiple challenges that are posed ahead.

In India, Plasmodium falciparum and P. vivax are two predominant human malaria parasites with presence of limited P. malariae and rare cases of P. ovale in some endemic states dominated by tribal

populations. Universal coverage of Long-Lasting Insecticidal Nets (LLINs) and Indoor Residual Spray (IRS) with insecticides with a limited use of larvivorous fish are the main intervention strategy for vector control. There is availability of Artemisinin-based Combination Therapy (ACT) for *P. falciparum* and chloroquine for *P. vivax* treatment. In the North Eastern states, ACT with sulfadoxine-pyrimethamine has been replaced with artemisinin-lumefantrine. Primaquine is administered for radical cure.

### **Malaria problems in Tribal areas**

States of Madhya Pradesh, Chhattisgarh, Jharkhand and West Bengal are under 'high burden to high impact' cover by WHO in India. Beside these, states of Odisha, Uttar Pradesh and some NE states need special attention. Odisha has made considerable progress with the implementation of a novel programme called Durgama Anchalare Malaria Nirakaran (DAMAN)<sup>1</sup>.

The tribal community represents 8.6% of the country's total population which contributed to 46% of total malaria cases and 47% malarial deaths in the country<sup>2</sup>. At present, malaria is prevalent mostly in tribal belts. Here the healthcare systems are not adequate<sup>2</sup>. The health seeking behaviour and responses of the local tribal population are traditional. They seek the local healer or unlicensed medical practitioner. This has compounded the issue more complex<sup>2</sup>.

### **Digital Surveillance: Need of the hour**

Global Technical Strategy of WHO envisages strengthening of surveillance to achieve the malaria elimination goal. There are several innovative methods that have been developed recently. Digital smart surveillance developed by us is one such device. It is a GPS-tagged, real-time malaria control system (MCS) hand-held device, currently under operation in Mangalore city since 2015.

This is a unique method of surveillance where the data can be retrieved anytime and can be analysed. Besides malaria surveillance, this system also activates the vector control team for taking immediate action. As per the recent report, malaria cases are now at a new low and expected to eliminate within the goal limit. This device can be used in other areas also since it is very easy to operate with minimum operational human resources<sup>3,4</sup>. The local health staff namely Auxiliary Nurse Midwife (ANM), Accredited Social Health Activists (ASHAs) can be trained and utilized for the real time digital surveillance.

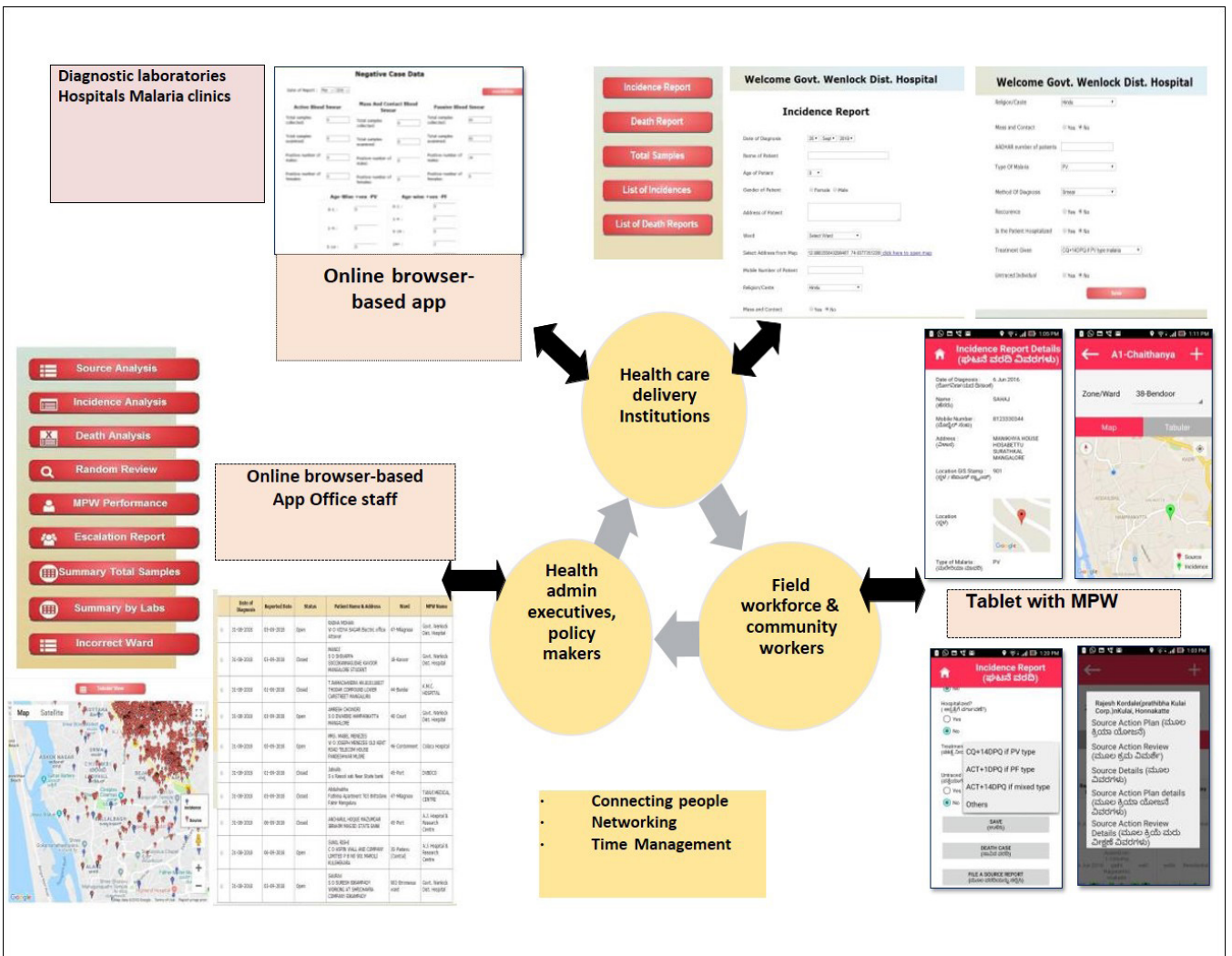


Figure 3: Concept, design and functioning of malaria control software (screenshots of dashboard, Multi-Purpose Worker tablets and lab login screen)<sup>3,4</sup>

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# Planetary Health Approach to Malaria Elimination in Post COVID-19 World- Nature's Way of Disease Control

*By Rajan R Patil, Epidemiologist, SRM University*

Malaria control and eradication programmes all over the world have been the biggest success as well as the biggest failure story of public health in the modern world.

Success story because in 1950s and 1960s malaria control programme began with use of insecticide spray for vector control to reduce malaria transmission resulting in dramatic reduction in malaria to its near elimination, giving rise to hopes for possibility of complete eradication of malaria from the face of this earth. However subsequent development of resistance of mosquitoes to multiple pesticides led to resurgence of malaria in the 1970s and since then it continues to be one of the top leading infectious disease among humans. In today's times achieving Malaria eradication appears not only impossible but also impractical goal in public health. This helplessness is not withstanding most advanced scientific developments in medicine and vector control as both mosquitoes and parasites continue to develop resistance with vengeance very often up to 70% non-susceptibility to newer intervention.

That's the only reason, all our artificial methods to exterminate either vector species or parasites have hit a roadblock. The eradication of malaria by elimination of mosquitoes is not only impractical but an immoral and unethical goal. Such goals stem from our anthropocentric view of nature where the interest of man is kept in the middle of disease making while sidelining the eco-centric view. The planetary health approach takes an eco-centric view and strongly advocates to manage malaria within paradigm of natural and ecosystem of the planet. It's high time we take a planetary health approach to malaria control and change the very paradigm and approach to it. The ongoing climate changes and its effects are only accelerating the creation of ecosystems that catalyze the further emergence and spread of vector borne disease.

## Concept of Planetary Health

The concept of planetary health is based on the understanding that human health is a subset of the overall planetary health. If we take care of our planet, the planet will take care of us. The mitigation of climate change and preservation of biodiversity of earth, are the new ways of addressing malaria and vector borne diseases as they are the biggest determinants of disease transmission. WHO in recent years has paid close attention to the association between biodiversity and human health. Biodiversity can be described in terms of species richness and species evenness. The species evenness represents proportional representation of each species. It is emphasized that different units of the ecosystem are not only interconnected but also interdependent. Every human action that alters the ecological balance and puts fellow species at risk of extinction will have direct bearing on human health. One of the direct adverse health effects due to biodiversity disturbance is evidenced through its influence on vector borne disease epidemiology.

## Dilution Effect

Biodiversity has a great influence on the magnitude and impact of epidemics. Correlation has been observed between decrease in disease frequency with increase in host diversity, this phenomenon in nature is termed as dilution effect that is exerted by species rich environment on epidemic potential of the disease. The presence of incompetent reservoir hosts dilutes rates of infection transmission between vector and competent hosts. Due to lack of biodiversity and reduced alternative source for blood meals, vector tend to concentrate on humans hence the force of infection on humans will be highest.

Dilution effect is demonstrated in the case of Lyme disease which is a vector borne zoonotic disease transmitted by ticks from white footed mice to humans. These mice are found in both species rich and species poor habitats. Consequently, species poor regions will show a higher proportion of white footed mice resulting in greater contact between tick and white footed mice. Ticks take on a major portion of their blood meals from these mice and invariably show higher prevalence of infection in the tick population. Addition of new species to the host community will dilute the presence of white footed mice. They also provide alternate source for blood meals from these additional species which are incompetent reservoir. Blood meal diversion from the mice to alternative hosts as a source, results into lower infection prevalence in ticks resulting in lower incidence of Lyme disease in humans.

## Climate Change- A Catalyst for Malariogenic Conditions

Climate change has a great influence on dynamics of disease transmission which is being evidenced by expansion of tropical diseases into temperate zones. Expansion of vector borne diseases is brought about by changes in temperature and humidity which are predominant factors in influencing breeding and survival of vectors. The ongoing climate change will push infection presently confined to tropical areas to expand into temperate regions. When pathogen move from tropical to temperate zone, it will encounter a completely new ecosystem that of highly diverse host community to lesser biodiverse environment.

Within the infection cycle, pathogens that show tendencies to infect multiple hosts, infection transmission is determined by the magnitude in terms of relative size of host within the species and between the species. Macro parasite distribution in a host population is determined by multiple factors of positive and negative density dependent processes. It is observed that parasites are concentrated in a small proportion of the host population when there is over dispersion of parasites. Thus, it can be inferred that over dispersion of parasites is driven by a positive density dependent process whereas under dispersion of the parasite population is driven by a negative density dependent process.

## Conclusion

Through this paper, the author argues the very concept and goal of disease eradication in public health calling for exterminating and uprooting entire species of vector/ or any microbes (parasite/ virus/ bacteria). It is not only impractical but immoral and unethical as it goes against the very spirit of preservation of biodiversity in planetary health. Nature has its own way of striking back when humans try to exterminate an entire species, by the way of evolutionary adaptations to survive and propagate.

Let us understand, we humans are not owners of this planet earth but mere cohabitants with millions of species with a need to conserve all species to maintain ecological balance. If we protect the planet, the planet will protect us.

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# SITUATION OF MALARIA

## Global

In last 20 years, the malaria cases declined from 238 million to 229 million among 87 endemic countries <sup>[1]</sup>

The WHO South-East Asia Region accounted for about 3% of the burden of malaria cases globally <sup>[1]</sup>

## National

India carries 2% of the global malaria case burden and 2% of global malaria deaths <sup>[1]</sup>

India reported total of 338,494 cases and 77 deaths in 2019 as compared to 186,532 malaria cases and 93 deaths in 2020 <sup>[2]</sup>

Community-based studies report burden of malaria in pregnancy by 10 to 30% <sup>[3]</sup>

## Tribal

Although tribal population accounts for 8.6 % of total population, community studies reported tribal population bearing 46% of all malaria cases in India in 2017 <sup>[4]</sup>

Tribal community reported 47% of all malaria deaths in the country in 2017 <sup>[5]</sup>

Burden of malaria-attributed morbidity among the pregnant women and infants from tribal communities in India is high <sup>[6]</sup>

### Source:

1. World Malaria Report 2020: (<https://www.who.int/publications/i/item/9789240015791>;)
2. NVBDCP website (<https://nvbdcp.gov.in/WriteReadData/1892s/64126746581634817515.pdf>)
3. The Indian burden of malaria in pregnancy needs assessment ([https://www.cell.com/med/pdf/S2666-6340\(21\)00166-5.pdf](https://www.cell.com/med/pdf/S2666-6340(21)00166-5.pdf))
4. Burden of asymptomatic malaria among a tribal population in a forested village of central India: a hidden challenge for malaria control in India (<https://www.sciencedirect.com/science/article/pii/S0033350617300720>)
5. High burden of malaria and anemia among tribal pregnant women in a chronic conflict corridor in India (<https://conflictandhealth.biomedcentral.com/articles/10.1186/s13031-017-0113-1>)
6. Malaria during pregnancy and infancy, in an area of intense malaria transmission in central India (<https://pubmed.ncbi.nlm.nih.gov/11235550>)

# Malaria Elimination Ring to Interrupt Transmission (MERIT): Tailoring innovations to the last mile to expedite malaria elimination

By Dr Kaushik Sarkar, Director, Institute for Malaria & Climate Solutions and Interim India Director Atul Kumar, India Programme Head

## Problem Statement

India has taken a tremendous stride against malaria, reducing the annual incidence of infection by about 85% between 2017 and 2020. However, with the progressive decline in transmission, malaria becomes concentrated in areas where the receptivity due to climatic and ecological factors and the vulnerability due to social and epidemiological factors are high. The tribal population residing in India's most hard-to-reach villages and hamlets are disproportionately affected by malaria due to exposure to forest ecology, marginalized and inaccessible settings, and often inappropriate health-seeking behavior. Targeting these geographies with intensive community-based interventions to interrupt transmission is a priority under India's National Strategic Plan.

ASHAs play a pivotal role in conducting malaria surveillance and providing malaria testing, treatment, and health education services in India at the grassroots. However, their last-mile reach is often restricted due to geographical inaccessibility, especially aggravated during monsoon- the peak malaria season. With the limited availability of services and the lack of appropriate education the tribal communities seek care from unskilled practitioners and traditional healers, not trained to deliver malaria treatment. In addition, the unavailability of a micro-level decision-support system that integrates malaria and climate information to forecast malaria and warn weather-driven inaccessibility further limits the scope of targeting interventions at the hotspots.

## Intervention

In 2019 Malaria No More (MNM) advanced Malaria Elimination Ring to Interrupt Transmission (MERIT), a precision programming model that aimed to deliver malaria control and elimination interventions targeting the communities who live in areas with the highest malaria transmission yet have limited access to malaria testing and treatment services. The model's pilot started in 2020 in Malkangiri and Koraput districts of one of India's highest malaria-affected states, Odisha. The model has four pillars of core interventions to strengthen the healthcare delivery system and



MERIT training

sharpen malaria programming at the last mile:

- Integrated communitization approach for fever testing and treatment
- Data-driven digital active surveillance and targeted action
- Early warning and risk stratification
- Health education, communication, and community mobilization

## Implementation

The implementation unit of MERIT is a district. The model is being implemented in each unit through a multi-level monitoring and surveillance workforce, overseen and supported by a state-level Strategic Support Unit for malaria elimination. The model is being delivered in each district unit in three phases—Preparation, Activation, and Micro-operationalization.

In the first phase of Preparation, MNM assessed the district landscape by analysing existing program data of the Government of Odisha and research data from MNM-conducted surveys in the state. One million WHO-prequalified Rapid Diagnostic Tests were mobilized through private partnership to top-up government supplies to provide the necessary surge capacity for malaria testing in the state. MNM then prioritized the two districts in discussion with the Government of Odisha and trained over 400 ASHAs and health workers in community-based workshops to enable them to assess the local risk of infection and deliver interventions through risk stratifications.



*Saathi providing health education*

The trainers used innovative tools like offline maps and coloured Bindi's to colour code risk status in MERIT workshops involving Medical Officers, health workers, and ASHAs.

In the Activation Phase, MNM rolled out a massive burst health education campaign, conducting miking using megaphones in the two districts. 16,098 people living in tribal hamlets were educated in malaria prevention, treatment seeking, and control and 2 million populations was indirectly benefitted through surveillance. MNM also trained and activated health workers and community volunteers, "Malaria Saathis" in 120 surveillance blind spots, detected jointly by the MNM and the Government of Odisha, to conduct hybrid (combined active + passive) surveillance. During this phase, MNM also conducted ASHA Mela to motivate the efforts of ASHAs and highlight their best practices among 142 ASHA peers. Another remarkable component of this phase was the development of the framework of a Malaria Prediction & Planning Tool (MPPT) integrating climate data, surveillance and program data of the two districts under MNM's global initiative, Forecasting Healthy Futures.

The model's Micro-operationalization phase began in January 2021, with the community volunteers serving as 24\*7 Fever Treatment Depots. The package of services included

- health education using megaphones weekly,
- home-based malaria testing, treatment, referral and community-based fever surveys, LLIN surveys, and mass screening
- monthly village cleaning drives, and nightly monitoring of usage of long-lasting insecticidal nets (LLINs) for strengthened vector control.

The "Saathi"s were monitored and supported by 38 "Doots", who functioned as the Targeted Intervention Implementers at the subcentres. The surveillance workforce is being monitored by a group of Field Coordinators through Tablet-based digital monitoring techniques, in which they have been trained in 2021. MPPT has been central to the enhancement of precisions for the grassroots programming mentioned above. The license for the use of the tools have been issued to the respective officials involved in the pilot. To further strengthen MPPT, MNM launched an innovative GIS mapping initiative, Malaria Mapathon, for 15,000 square kilometres area of the two districts.

These map layers, for the MPPT dashboard, tag every dwelling, clinic, street, vegetation, body of water, and other relevant features to provide enhanced analytic and predictive capabilities to MPPT.

## Result

The data triangulated from different surveys and district surveillance reports demonstrated the feasibility of strengthening system and service delivery at the most marginalized settings, promoting equity of health interventions and malaria prevention tools.

- The surge capacity building through the mobilization of rapid diagnostic tests and intensive monitoring of surveillance and supply chain resulted in the increase in malaria surveillance by an estimated 13% across five most-affected districts. An estimated 46% malaria cases of the state in 2019 could be detected through the strengthened surveillance.

- The health education model combining burst campaign followed by pulse communication integrated with nightly LLIN monitoring resulted in the achievement of 99.19% use rate of LLINs across targeted hamlets in 2021 against state average of use rate of 87% measured through a KAP survey in 2019.
- Two of the 120 malaria Saathis have already been inducted as ASHAs in their respective villages—a model of capacity building demonstrating success.
- The Doots and Saathis have achieved 39.6% annualised blood examination rate in a period of 9 months conducting 4,782 tests. 132 malaria cases were provided complete treatment in the hamlets across the period.

### Replicability/ Scale-up

- Encouraged by the success, MNM was requested to scale the direct benefits by the Government of Odisha. The monitoring package has been expanded from 6 high endemic blocks to two districts through doubling of the monitoring workforce at the block level. The number of intervention target subcenters has been increased from 38 to 100 covering about 300,000 people. The new targeted intervention implementers (TIs) are currently being recruited and trained under the scale up plan. MNM is also equipping the TIs with android devices and enhancing the MPPT's capability to transform paper-based surveillance to digital active surveillance with the use of cloud and Artificial Intelligence (AI) technologies.
- To integrate the private health providers (PHPs) into malaria surveillance, MNM has already mapped the PHPs across the two districts. MNM is currently implementing a PHP survey to understand the practitioners' need to report malaria to the public health system. The next step is to train and engage the PHPs in malaria surveillance through workshops, which has been planned for January 2022.
- Under the Forecasting Healthy Futures initiative, MNM is collaborating with the India Meteorological Department and the state vector borne disease control programme division of the Government of Odisha to pilot the MPPT across two districts. At the national level, MNM has convened an Interagency Expert Committee on Malaria & Climate engaging the officials and advisors from the Indian Council of Medical Research, National Centre for Disease Control, and the India Meteorological Department to advise climate-driven malaria solutions.
- To promote replicability and enhanced support, MNM has activated a multisectoral Malaria Action Coalition under the Chairmanship of the Secretary, Health & Family Welfare, Government of Odisha. MAC currently features commitment from 20 different organizations to sustain support accelerating malaria elimination in the state of Odisha. Several organizations have advanced their support for the culmination of the model and its components, including but not limited to Abbott, Star-Disney, Vestergaard, Cognizant, alongside the FHF initiative.



# Elimination of Mosquito Borne Endemic Diseases in Tribal Populations in India – Glimpses from the EMBED project

By Dr Bitra George and Som Kumar Sharma, Family Health India

## Problem Statement

Malaria is one of the priority diseases under the National Vector Borne Disease Control Program (NVBDCP) of the Government of India with the malaria elimination goal by 2030. Tribal populations are particularly at risk of vector borne disease as they mostly reside in forest areas, have poor access to health services and depend on local healers for health services. Most tribal populations live in remote rural pockets making it challenging to access quality health education and services. Chhattisgarh and Madhya Pradesh have high tribal populations, 30.6% and 21.1% respectively (as per census 2011) and contribute to nearly 24% of total malaria case load in India.



Malaria Awareness Van

## Intervention

Family Health India (FH India) has been implementing Elimination of Mosquito Borne Endemic Diseases (EMBED) funded by Godrej Consumer Products Limited (GCPL) since December 2015. The project targets to achieve malaria elimination in 17 districts covering 2,500 high malaria endemic villages and 37,50,000 households across Chhattisgarh, Madhya Pradesh and Uttar Pradesh. The project is covering 16 tribal groups including Saharia, Bhil, Gond, Baiga, Kol, Madia, Dhurvea, Muriya,

Halba, Bhatra, Ganda, Ghasia, Agaria, Panika, Pathari and Khairwar.

Some of these tribal groups come under the Government of India's list of indigenous and most primitive tribes. EMBED intervention focuses on malaria elimination through behaviour change communication for prevention, control, and management of malaria at the individual, home and community level and builds capacity of health care providers and decision makers. The project aims to achieve zero indigenous malaria cases in the intervention villages over three years of intensive technical assistance and community engagement approaches, thereby contributing to the malaria elimination goal for the district.

### Implementation

The implementation process comprises of the following steps which are as follows:



Health Camp

- Organising community drives for mass mobilization of community members to improve awareness on preventing collection of water and cleanliness of surroundings.
- Supporting Village Health and Nutrition Days (VHND), especially to address pregnant and lactating women for promoting preventive behaviour for malaria.
- Engaging with Panchayati Raj Institutions (PRI) to initiate community action and management of water bodies through oil filling; release of gambusia larvicidal fish; and covering stagnant water bodies through:
  - o Gram chaupals
  - o Awareness vans and nukkad natak
  - o Infection and Prevention Control during home visits including vector control measures
  - o School education programs
- Supporting health system strengthening through capacity building of ASHA workers and health care providers through dedicated e-Learning modules on malaria in Hindi, Gondi and Halbi language especially for providers in tribal pockets by:
  - o Adopting National Vector Borne Disease Program training module
  - o Incorporating Learning Management System (LMS) for tracking of learning outcomes of ASHAs

- Improving Malaria surveillance; performing data analysis at sub district level to identify hotspots and implementing targeted activities; preparedness, detection and response for any malaria outbreak and supporting intensified monitoring and supervision activities.
- Developing Real time management information system (RTMIS) by:
  - Concurrent monitoring mechanism for mid-course correction
  - Digital conversion of all reports and records starting from household to project level dashboard.
- Behaviour Change Communication (BCC) through household (HH) visits to improve health seeking behavior for early diagnosis of fever and prompt and complete treatment of malaria positive cases.
- Ensuring >80% usage of Long-Lasting Insecticide Nets (LLIN) by community, and other preventive behaviour including use of mosquito repellents.

## Result

Over 5 years, reduction in Malaria cases is seen in 100% intervention districts.

- 31% and 10% increase in blood smear examination in EMBED intervention districts of Chhattisgarh and Madhya Pradesh respectively during the year 2020 in comparison to year 2019.
- 64% and 33% decrease in total malaria positive cases in EMBED intervention villages of Chhattisgarh and Madhya Pradesh respectively in year 2020 in comparison to the year 2019.
- State governments have recognized the EMBED model as an effective strategy for malaria elimination and have adopted the behavior change communication toolkit under NVBDCP.

## Constraints

- COVID-19 pandemic and related restrictions affected the community outreach in the initial days of lockdown. COVID-19 restriction also hampered the intervention.
  - Health care providers' engagement in malaria prevention, control and treatment was diverted to the emergency response for COVID-19 management.
  - Households were not ready to engage in health education programs due to fear of COVID-19.
  - School awareness programs could not be undertaken due to closure of schools.



*Training of ASHA by E learning module*

- In- and out-migration in tribal areas (average of 3-4 months in a year for livelihood), increases the resurgence of malaria as returnee migrants become carriers of the parasite.
- Excessive rainfall in the non-monsoon season in 2021 resulted in an unexpected increase in mosquito breeding sources undermining the intensive source reduction efforts of the project.

### Replicability / Scale-up

- The EMBED team has an intensive transitioning strategy wherein in addition to the routine engagement with the district health administration and the ASHA workers, in year 3 of the intervention, the team provides handholding support to ASHA workers in conducting gram chaupals using the EMBED BCC toolkit; supporting the ASHA to prepare micro plans for household visits for malaria prevention, fever survey and vector control measures; and supporting ASHAs to report on key malaria indicators including blood smear examinations conducted and treatment completion follow-up of malaria positive cases.
- The BCC toolkit developed by EMBED has been adopted by the health departments of all three intervention states and is printed through NHM funds for use in the entire state.
- EMBED team supports the District Malaria Officer in identifying the needs of districts and rational deployment of resources in the annual project implementation plan of National Health Mission.
- EMBED ensures regular knowledge and experience sharing with national and state NVBDCP for adoption of best practices of EMBED.



*Distribution of LLINs in the community*

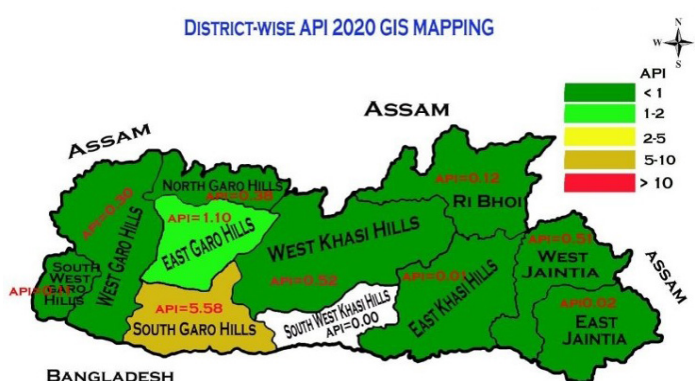
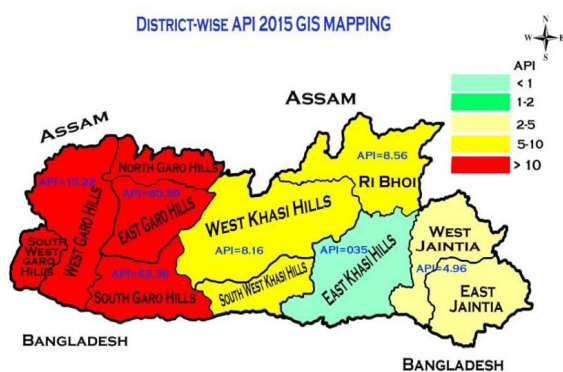
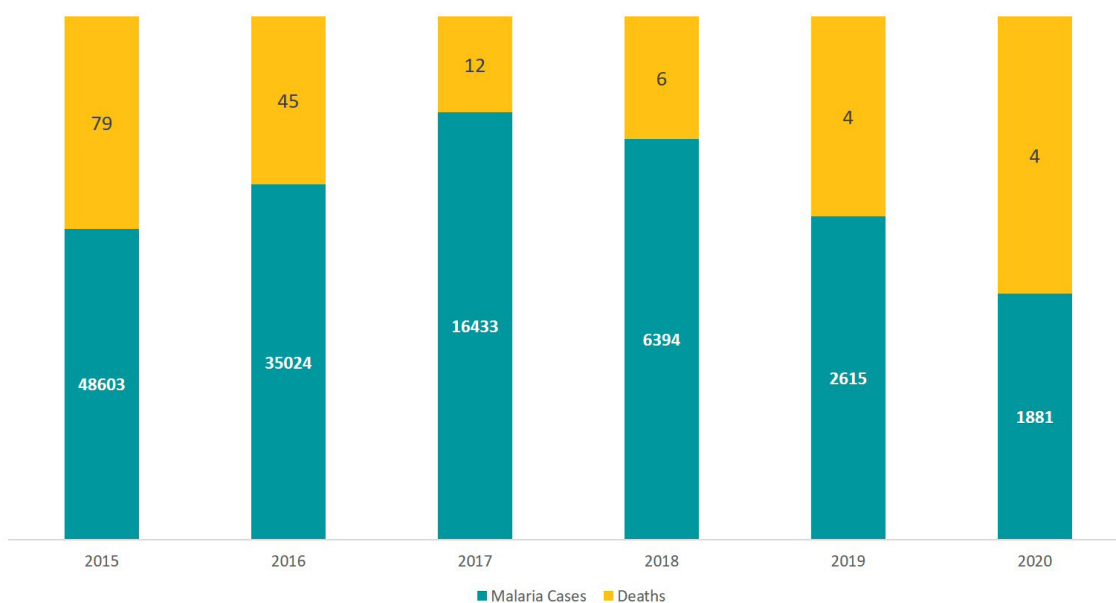
# Intensified Malaria Elimination Project in Meghalaya

By Dr B Marak, Deputy Director Health Services (Malaria) Lawmali, Polo, Shillong

## Problem Statement

In India, Malaria is considered as one of the major public health problems. North Eastern India alone contributes to 12% of India's malaria cases. The occurrence of Malaria in Meghalaya has been primarily endemic due to its peculiar climate, topography, and terrain, which leads to a rich diversity of malaria vector distribution. The State Epidemiological Situation analysed from 1997 to 2019, reveals that the State reported the highest deaths caused due to malaria in the year 2007 with 237 deaths. As evident from the graph below, malaria cases are declining in the state of Meghalaya which can be attributed to the efforts taken by the government of Meghalaya in reaching out to the communities till the last mile.

Malaria Situation in Meghalaya



As observed from the above maps the API (Annual Parasite Incidence) indicator, a major indicator for malaria morbidity, has declined in all the districts from 2020 in comparison to 2015.

## Intervention

The key interventions in the control of Malaria in Meghalaya are in line with the National Strategy for Malaria Elimination 2030. The main strategies can be broadly categorised into Early Detection and Complete Treatment (EDCT) and Integrated Vector Management which include promotion of Long-lasting Insecticidal Nets (LLINs), intensive IEC, capacity building of health care workers and community volunteers, increase in human resource and monitoring mechanism.

## Implementation

The role of ASHAs has been crucial in the implementation process as they are the ones to reach out to the communities for detection of active cases and to ensure that all cases of fever are being captured. A constant and in depth data analysis is being done for surveillance data that was captured at all levels to identify early warning signals that could lead to outbreaks. In the health facilities, microscopy is still regarded as the gold standard for cases detection by the use of blood slides for examination which is why the health facilities particularly in the endemic zones are being provided with microscopes under the programme. Lab Technicians undergo training regularly at the regional offices of Health and Family Welfare, Shillong under the guidance of the Regional Director.

The ASHAs and health workers are supplied with medicines which are provided free of cost to the communities. Artemisinin Combination Therapy is administered to all the positive cases, in line with the National Drug Policy 2013. Regular monitoring of all health activities by officers and consultants of the office of the State Programme Officer, NVBDCP, Shillong is being done to ensure that the planned programme activities are being carried out. This has enabled a robust and efficient system of reporting and track stock outs. The state programme office organises regular intersectoral meetings and advocacy workshops to engage stakeholders from other line departments in programme implementation. This convergence also initiates brainstorming for corrective interventions. Regular IEC/BCC campaigns are being organised to mobilise community participation and create awareness on the disease and its prevention.

The state has been allocated four entomological zones and each zone has been assigned a dedicated entomologist that carries out regular adult vector monitoring and mapping of potential vector breeding sites.



*Beneficiaries using LLIN's*



*Transportation of LLIN's to the beneficiaries.*

Indoor Residual Spray (IRS) activities are being implemented in areas where the API>2, Dichlorodiphenyltrichloroethane (DDT) is being used to spray the indoors of dwelling where vectors primarily rest after a blood meal. All the villages under Sub centres with an API>1 are being saturated with long lasting insecticide treated nets. Larval control through source reduction and biological and environmental measures are being carried out regularly by the zonal entomologist. Foci based adult vector control interventions is being carried out in and around 50 houses of positive cases where focal spray followed by IRS are being carried out regularly. Regular monitoring is being carried out to ensure compliance of LLIN usage by all beneficiaries.

## Results

- The state has achieved an overall decrease of 96% case reduction from 2015-2020, this includes all Pf and Pv cases.
- The state has achieved a decrease of 94 % malaria mortality from the period 2015-2020.

## Constraints

- Difficult terrain and inaccessibility to far flung health facilities and villages during the rainy seasons hamper surveillance activities.
- In Meghalaya, considering the human element from both socio-demographic and geographical point of view and in particular the human mobility factors can contribute to the possible resurgence of malaria morbidity.
- The rearing of silk worms and the practice of apiculture restricts the full coverage of IRS operations in certain parts of the state and is often accompanied by strong refusal for any insecticides.
- Strong superstitious beliefs by certain sections of society in the state hamper the implementation of various interventions under the programme. Local traditional healers are still a choice for many in the rural setting.
- In light of the recent pandemic, communities are reluctant to approach health facilities or health workers to get tested on fear of being diagnosed with SARs COV-19.

## Replicability/Scale Up

- The activities carried out by the office of the SPO, NVBDCP and the respective DMO's are self-sustainable and serve as a good and replicable model for implementation in other states or areas where malaria is endemic.
- The concept of The Tura Model (<https://thelogicalindian.com/good-governance/meghalaya-malaria-issue-reduction-27062>) which has proved to be immensely successful in the early detection of malaria cases by the ASHA's can be utilised as a proven tool for surveillance.

# Project Durgama Anchalare Malaria Nirakaran (DAMaN): Access the Inaccessible

By Team Alekh

## Problem Statement

The state of Odisha is home to malaria due its climate, topographical diversity and complex vector bionomic such that it favours breeding of mosquitoes like falciparum malaria in high proportion (>90%) which cause complications as well as death. Malaria morbidity and mortality is significantly high in these forested hilly areas given the poor health seeking behavior of the community and also the poor accessibility to health services. Since the community is mostly tribal, marginalized and has a poor literacy rate, challenges of poverty, treatment seeking from informal healers and low malaria awareness remain rampant.

Largely the population in Odisha is tribal while due to rapid industrialisation and urbanisation, there is a presence of seasonal workers, travelers, and pilgrims etc. in this low endemic coastal area. During the transmission season in monsoon, the inaccessibility of the area hinders service delivery further. This impedes the progress towards malaria control and brings out the need to develop strategies tailored specifically towards the dynamic condition in this area. It is observed that around 20% of malaria cases in these areas are asymptomatic.

## Intervention

Project DAMaN is a first of its kind model initiative by the State of Odisha which was conceptualized in 2017 to control malaria in inaccessible areas. Comprehensive Case Management Programme (CCMP) was commenced in 2013 in four districts of Odisha leading to 47 per cent decline in malaria cases between 2015 and 2017. This was part of World



Community Health Volunteers reaching out to inaccessible areas

Health Organisation's Test-Treat-Trick initiative that scaled up diagnostic testing, treatment and surveillance for malaria in Odisha.

The experience from CCMP led to the birth of project DAMaN where CCMP was initiated in 22 districts under this initiative. This project is jointly implemented by Indian Council of Medical



Research-National Institute of Malaria Research (ICMR-NIMR), National Vector Borne Disease Control Programme (NVBDCP), Odisha and Medicines for Malaria Venture (MMV). The intervention in the project is done through a vulnerable centric approach providing a package of activities through inter sectoral convergence and inclusiveness.

### Implementation

Project DAMaN, is a tailor-made malaria elimination strategy under the umbrella of National Health Mission to control and eliminate malaria through strengthening surveillance, social mobilization and capacity building to focus on pregnant women and young children. The following activities have been carried out under the initiative:

- Mass screenings and treating positive cases and dipping the infected anopheles' mosquito vector population with effective and supervised vector control measures promoting the use of LLIN and conducting indoor residual spray.
- All remote, inaccessible and unserved areas were addressed by DAMaN to detect all malaria infections with or without fever by using bivalent rapid diagnostic test (RDT).
- Focus on health awareness and community mobilization was achieved with the help of ASHA workers, Anganwadi Workers and Panchayati Raj Institution workers.
- Effective IEC using audio visual, raths and folk arts was carried out.
- Entire population was targeted where priority was given to under five-year-old children, pregnant women and lactating mothers. Besides malaria screening and treatment, checks and measures were taken to assess nutritional status and anemic cases in order to provide supplements and nutritional support through Integrated Child Development Services.



AWWs are critical to eliminate and eradicate malaria

### Result

From 4,36,850 malaria cases reported in 2015, Odisha had 66,301 cases reported in 2018, an 85-per cent reduction, giving the eastern coastal state the reason of reporting the highest reduction in malaria cases across the country, as per data from the Health Ministry's National Vector Borne Disease Control Programme.

### Replicability/ Scale-up

Intensifying community level engagement, capacity building, inclusive approach, and inter sectoral coordination and inter-ministerial collaboration in the project helped changed the narrative of India's malaria situation.

# Malaria Mukh Bastar Abhiyan : Chattisgarh's War on Malaria

By Team Alekh

## Problem Statement

The dense forests of Bastar have tough terrain as well as sprawling river beds. The danger that lurks here is malaria which has taken a significant amount of life in this tribal area. The Bastar zone in Chhattisgarh is a location that is endemic to malaria parasites plasmodium vivax and P. falciparum. When Chhattisgarh came into existence in November 2000, its Annual Parasite Incidence (API-malaria) stood at 16.80 while reaching 10 in 2002, which was still among the highest in the country. It came down to 1.97 in 2019 owing to the efforts and effective intervention by the government. But still in 2019, Chhattisgarh with 2.29% population contributed to 18% malaria cases of the country, while the Bastar division contributed to 76% malaria cases of the state. The region also has a high maternal mortality rate along with high malnutrition and cases of anemia.

## Intervention

In 2020, Malaria Mukh Bastar Abhiyan was launched in three phases, first one being organized between January- February '20 in selected high endemic blocks of Bastar division under 7 aspirational districts. The other two phases were organised in June-July '20 and December-January '21. The campaign focuses on:

- Reducing morbidity and mortality due to malaria in the State and especially in tribal predominant high endemic blocks with special focus on pregnant women, lactating mothers and under 5 years' children.



Sticker pasted at entrance of each house containing details of total family members and members screened

- Reducing parasite load in the community in high endemic pockets by diagnosing symptomatic and asymptomatic malaria cases to ensure complete treatment.

The first phase was chosen as January- February because as per last 3 years' data, 3 peaks were reported in districts of Bastar division in the month of July, November and January.

26 blocks were reached in the first phase, 30 in the second while 55 blocks were reached in the third phase.

### Implementation

The strategy for implementation has been mass screening with an objective to eliminate re-establishment of local transmission and resurgence of malaria. The activities undertaken under the campaign were door to door visits by survey teams to achieve 100% coverage of the targeted population by following Test, Treat and Track approach. LLINs monitoring was also completed during door to door survey.

The survey team facilitated provision of local food to malaria positive cases to avoid drug intake on empty stomachs. Wall stickers and stencils were used as symbols outside the surveyed houses to identify the house and left-out persons. Treatment card was also issued to all malaria positive cases



Survey teams using boats to cross rivers to ensure 100% coverage

for ensuring complete treatment and verification during case follow up. There has been a follow up slide preparation after one month of treatment completion and examination to ensure parasite elimination.

Malaria Mukht Bastar Raths were deployed for IEC in each district of Bastar division. Awareness through Haat-Bazaars was organised through health camps and effective IEC related to Malaria. Whistling and ringing of bells in the evening by Mitanins (female health volunteers) for community awareness on using LLIN was another innovation. Effective intersectoral coordination with different departments like Public Health and Engineering, Education, Women and Child Development, Fishery, Forest Department, Panchayati Raj and Rural Development has been done too. Entomological surveillance in coordination with the National Centre for Disease Control was also carried out along with other activities on ground.

## Result

A third party evaluation conducted by UNICEF and State Health Resource Centre concluded that 91.30 of the population has been covered during the campaign while 95% malaria positive cases were given complete treatment as per Gol guidelines. According to the NHM data, the two-phased test and treatment drive covered nearly all 6,000 villages in the region with a population of nearly 37.8 lakh.

## Replicability/ Scale-up

- Encouraged by the success of Malaria Mukht Bastar, the state has embarked upon the Malaria-Free Chhattisgarh mission. To start with, the Sarguja division of North Chhattisgarh is presently taken up where the treatment process of positive cases has begun.
- The WHO's World Malaria Report 2020 has highlighted India's gain in elimination of Malaria emphasising on how Bastar has won over challenge on malaria as annual parasite incidence reduces to historical low.

## References

- National Health Mission Best Practices presentation





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To share your valuable feedbacks and/ or to contribute to ALEKH's next issue please contact us at [aso-health-tribal@tribal.gov.in](mailto:aso-health-tribal@tribal.gov.in)