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**Health and Population:
Perspectives and Issues**



आरोग्यम् सुखसम्पदा

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Lessons Learnt from Malaria Elimination in Malkanagiri District, Odisha and the Way Forward

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Abstract

As per the World Malaria Report 2019, India achieved a reduction of 2.6 million malaria cases in 2018 than 2017. This sharp reduction of 28 per cent of malaria cases indicates the success in malaria elimination strategies not only in macro level but also in micro level. The present study tries to evaluate the malaria elimination strategies adopted in micro level of Odisha. A qualitative study was undertaken using tools like In-depth interviews (IDIs) and focus group discussions (FGDs) among different stakeholders of service providers and service accepters in two villages of Malakangiri district to understand the micro level strategies adopted for malaria elimination. The study reveals that the Durgam Anchalare Malaria Nirakaran (DAMaN; the English translation for the Odia words- Malaria Elimination in Inaccessible Areas) programme helps in the reduction of malaria infections in inaccessible part of scheduled areas. Use of tools like tracking, testing and treating (3T), regular and compulsory usage of long lasting insecticidal net (LLIN) and acceptance of community participatory awareness practices for behavioural change are the major reasons in reduction of malaria. However, some suggestions like arrangement of DAMaN camp three times a year, keeping sufficient stock of anti-malaria drugs and RDT kits with ASHA and timely replacement of LLINs should be taken into consideration to achieve zero prevalence of malaria while compulsory registration of inter-state migration data with active surveillance mechanism at panchayat/village level will control incidence of malaria. Besides, leadership training for ASHA, increment of monetary incentives for community level health workers and use of tribal art, music, dances, musical instruments and languages to disseminate health education. Lastly, developing social infrastructures and connectivity and recruitment of health human resources and focus on tribal research will help in malaria elimination in future.

Key words: Malaria, DAMaN, development, tribes, community participation, health education,

Introduction

Malaria is one of the aged mosquitos borne parasitic disease with significant burden in different parts of world, particularly in lower and middle income countries (LMIGs) of the tropics, transmitted by female anopheles mosquitos. As per world malaria report 2019, a total of 22.8 crore malaria cases and 405 thousand related deaths occurred globally in 2018. According to world malaria report 2018, India's contribution to total malaria cases was 87 per cent in Southeast Asia having 3 per cent global malaria burden. A sum total of 8 lakh and 40 thousand confirmed

malaria cases and 194 related deaths occurred in India in 2017, as per the national vector borne disease control programme (NVBDCP). India has highest burden of vector borne diseases (VBDs) both in cases and deaths in the world whereas Odisha is situated in the eastern part of India having 4 per cent of land and 3 per cent of population, has the highest burden of malaria (40%) in India in 2017¹. Maximum part of Odisha is conducive to malaria transmission because of its high humidity, hilly forested areas with perennial streams and medium-to-high rainfall. It is observed that both the malaria transmission and burden are region specific and the Koraput-Bolangir-Kalahandi (KBK) region has experienced high risk of infection followed by northern and western districts². However, understanding the negative consequences of malaria, targets were set with various strategies to eliminate malaria both globally and regionally. According to world malaria report 2018, elimination of malaria by 2030 is one of the goals of sustainable development of goals (SDG) globally. To achieve this goal, the global technical strategy for malaria 2016-2030 was adopted by world health organisation to eliminate malaria by 2030. In response to WHO's strategic plan, malaria control interventions have been scaled up and strategies were made to eliminate malaria in India by 2030 with the start of national framework for malaria elimination (NFME) in February, 2016. Later, with a shifting focus from "control to elimination", India adopted five-year national strategic plan for malaria elimination in 2017³. Indian council of medical research (ICMR) also joined hand with Government of India through its institutions to eliminate malaria by demonstrating the best strategy⁴. Understanding the high infection rate of Plasmodium falciparum in the high malaria endemic districts, national vector borne diseases control programme (NVBDCP) adopted compressive case management programme (CCMP) to strengthen surveillance and to identify the asymptomatic/ afebrile malaria cases (malaria infection having no fever). The asymptomatic cases are silent reservoirs for malaria. To combat asymptomatic reservoirs, the Government of Odisha started its own flagship programme, one of the biggest public health interventions, *Durgama Anchalare Malaria Nirakaran* (elimination of malaria in inaccessible areas) in short DAMaN, from state's own fund in 2016 in all hard-to-reach areas of Odisha². However, DAMaN was implemented in remote and inaccessible pockets to eliminate malaria in 2017.

As per world malaria report 2019, India has made impressive progress in malaria control over the past two decades and India achieved the largest malaria cases reduction, with an amount of 26 lakh cases, in 2018 than 2017. This sharp 28 per cent reduction of malaria cases indicates the success in malaria elimination strategies both at macro and micro level but the question arise is it the same strategies adopted both at macro level and micro level or any new strategies adopted at micro level because all regions have not the same setting. To understand these questions, the study tries to evaluate the malaria elimination strategies adopted at micro level of Odisha.

Methodology

As per tribal health report, India, tribal communities constitute only 8.6 percent of national population but accounts 30 percent of all cases of malaria and 50 percent mortality associated with malaria in India. As per Census of India 2011, the percentage of scheduled tribes is 22.8% in Odisha contributing 9.17 percentages to total tribal population of India and is the third highest tribal population among states of India. A total of 62 different tribal communities where 13 belongs to particularly vulnerable tribal groups (PVTG) are residing in Odisha. The Koraput-Bolangir-Kalahandi (KBK) region has not only high malaria infection but also this region is historically

underdeveloped compare to other part of Odisha where most of the districts of this region are coming under aspirational districts list, prepared by national institution for transforming India (NITI Aayog), Government of India and the southern part of Odisha is more underdeveloped among KBK region. To improve inclusive growth and standard of living of citizens and also in the ranking of human development index, the initiative like transformation of aspirational districts has undertaken by NITI Aayog. The index is the combination of different indicators comprising of health and nutrition, education, financial inclusion and skill development, agriculture and water resources, and finally basic infrastructure. The undivided region of Koraput is comprised of four districts namely Koraput, Malakangiri, Nabarangapur and Rayagada. The malaria infection is high in Koraput-Bolangir-Kalahandi (KBK) region and most importantly, the annual parasite incidence (API) status, the number of malaria cases per 1000 population, is more than 10 among 12 districts of Odisha in the year of 2016¹. All the southern districts are coming under these 12 districts of high API. According to census of India 2011, more than 50% of population is tribes in each of the districts and the health indicators of tribal population are not good in Odisha. Besides, the total population belongs to both scheduled tribes and scheduled castes are highest in Malakangiri district among other districts. The district is situated at the bottom of the southern region of Odisha and adjacent to two neighbouring states like Andhra Pradesh and Chhattisgarh. In addition to, the district is hilly area with densely forest area, even hard-to-reach area with sparsely inhabited by indigenous tribes and also having presence of left-wing extremism.

Understanding the three important concepts like annual parasite incidence status, human development index and region, the study was conducted in Malakangiri district, which is coming under the undivided region of Koraput, part of larger KBK region is also in the list of aspirational district. In this context, the author had conducted a qualitative study in two villages (one is situated near to main road and other one comprising of only 10 households is situated in the hilly area, hard-to-reach area, with a distance of 12 kilometres from the main road) of Malakangiri district to understand malaria elimination strategies adopted in grassroots level. Tribal, basically koya and parja tribes are residing in these villages. The study was conducted in the month of 28th November 2018 to 4th December, 2018 and again telephonic interview was also undertaken during the year 2020. Both the techniques like in-depth interviews (IDIs) and focus group discussions (FGDs) were used to explore strategies undertaken at the grassroots level. IDIs and FGDs were conducted among different stakeholders of service providers like community level health workers, members of local self-government and members of community level organizations and service accepters/ beneficiaries of malaria treatment and common people of the village to know their views and perceptions regarding strategies. Besides, staffs and officials of health and line departments were also interviewed. Total 15 members were interviewed and two FGDs were organized where every discussions comprising of 6 to 10 members depending upon the availability. Community level health workers are accredited social health activists (ASHA), anganwadi workers (AWW) and auxiliary nurse midwife (ANM) and male health worker. The triple A (ASHA, AWW, ANM) are the three women working at the grass-root level to cater health care services where ASHA is from national health mission and ANM and male health worker are from health and family welfare department and AWW is from the scheme of integrated child development services (ICDS) of department of women and child development and mission shakti. Ward member and sarapanch are the lowest and the highest elected representatives of the panchayat (village assembly) respectively and are empowered by panchayats (extension to scheduled areas) act, (PESA) 1996 belong to Panchayati Raj Institutions (local self-government).

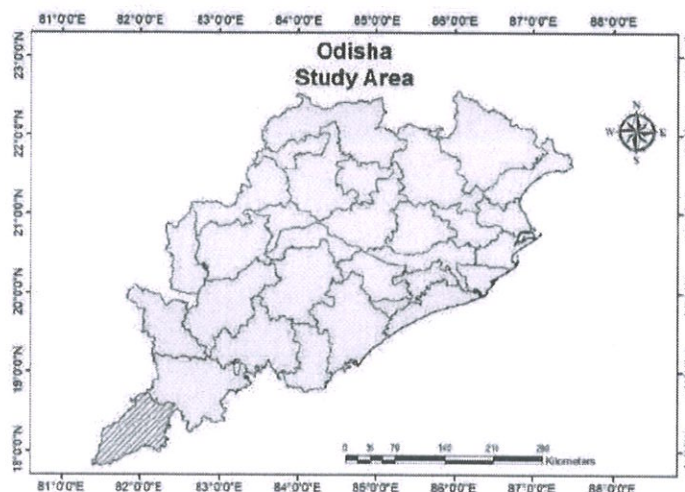
Apart from, members of non-governmental organizations (NGOs) and women self-help groups (WSHG) belong to community level organization. Besides, the public health system has their own community participatory structure at village level known as village health and sanitation committee (VHSC) (commonly known as Gaon Kalyan Samiti (GKS) in Odisha) comprising of community level health workers (ASHA, AWW) and member from local self-government (ward member) and member from community level organizations. The beneficiaries include local residents of the village which includes males, females and children of different age groups and local priests those are mastered in witchcrafts, herbal

Table 1
Thematic Guide for Qualitative Study undertaken in Malkangiri District of Odisha

Stakeholders [Nos.]	Domains of Inquiry Sub-Themes
In-depth Interviews with health workers, community members (VHSC, PRI, CO), beneficiaries and officials [15] & Focus group discussions (FGDs) with health workers, community members, beneficiaries and officials [two with 6-10 participants each]	What is malaria? Why is it important to discuss? What is the relation of malaria with local weather/region? What is the development condition of this locality? What are the strategies are adopted to eradicate malaria? What are the methods to eliminate malaria? How it is implemented at micro level? Who are the main stakeholders? What are the awareness activities undertaken? Any suggestion for zero elimination of malaria

medicines, generally known as Dishari, the local word. Even the interviewer also interviewed the resident who is a maoist-turned-layman. After interview with all stakeholders, the interviewer used the content analysis to analyse data. Proper care was also taken from collect data to coding to analysis.

Figure 1
Primary Study Conducted in Malakangiri District of Odisha, 2018-20



Source: Registrar General of India, 2013

Findings

Track, Test and Treat (3Ts) Method: Maximum villages and hamlets with very low population having high transmission of malaria are dispersed among large forest areas. Routine activities are continued to address malaria through the year. ASHA communicates about the local level malaria cases to the local health authority. Besides, routine programme, DAMAN programme (say camp) is arranged two times i.e. pre-monsoon (April-May-June-July) and post-monsoon (September-October-November-December) in a year at the anganwadi centre or school premise with a team consisting of both male and female health workers, health supervisor, NVBDCP staffs and officials of primary health center with the support of ASHA and AWW. Both the village have anganwadi centres and also water connectivity but school building is under construction in hard-to-reach area. Besides, road inaccessibility and non-connectivity of mobile network are also observed in hilly area. Sometimes the camp is continued for two days to cover all the population of that inaccessible area. In the camp, mass screening of all residents is conducted with the use of bivalent rapid diagnostic kits for early case detection and then all the confirmed positive cases are treated and monitored. Mass screening and treatment (MSAT) is conducted to target the asymptomatic cases. Besides, anthropometric measurement and haemoglobin estimation are done to know the nutritional status and particularly the anaemic cases of all the population of the village with special importance to pregnant mothers, lactating mothers, under-five children. The iron-folic acid (IFA) supplementation is distributed among anaemic cases and malnourished children are provided nutritional support through integrated child development services. As most of the residents of the villages go to agricultural field or block headquarter for their day to day activities in day time, a prior meeting is organized among members of GKS to mobilize the people for the DAMAN camp, where ASHA plays an important role for information dissemination, to achieve full participation of local residents, however, some residents are missed at the time of camp. It is observed sarapanch and ward member are also helping in the mobilization. Instead of their missing at the time of camp, the ground level health workers give their best to include them in the camp in the next day. It is also observed, sometimes, the anti-malaria drugs and testing kits are not available with ASHA. Some positive cases are found in these villages due to migration of labourers from the border-states of Andhra Pradesh and Chhattisgarh. It is also found that, community level health workers are concerned about their security due to their work in remote and maoist-infested areas. One of the interesting observations is noticed that the staffs and officials at micro level i.e. sub-district level (block level) are more interested and eager to participate in survey but it is not same in case of district level. However, some district level officials are also participated.

Regular and Compulsory Usage of Long-lasting Insecticidal Net (LLIN): LLINs are freely distributed among the population with proper survey and planning by both the health department and district administration. LLINs are contributed by the Global fund to fight AIDS, Tuberculosis and Malaria (GFATM). The couples are given double size net whereas single net is provided to any adult persons like son, daughter and any aged person. ASHAs are ringing the bell (*ghanta* in odia) at evening every day to remember the people to use the net regularly. The members of GKS, especially ASHA, AWW and ward member conduct night supervision to every resident of ward/hamlet/village to check and sensitize about the use of LLINs. Besides, staffs and officials from sub centre, primary health center, community health centre and national vector

Figure 2
Survey is Conducted during DAMaN Camp
at One of the Hard-to-reach Villages of Malakangiri District, Odisha



borne diseases control programme (NVBDCP) and district level are supervising and counselling the residents with the support of ground level team at night. In addition to, local school teachers, village level forest department representatives and village representatives of revenue department visit the household in their respective locality to check the usage of net and counsel for regular use of LLIN among residents during its initial distribution period. During night supervision, many times, people resist to use net still they counsel about the importance of regular and compulsory use of LLIN. It is observed that the maximum LLINs are tore up and also used for more than years.

Community Participatory Awareness Practices for Behavioural Change: Different information education and communication (IEC) awareness campaign strategies are introduced for behavioural change of the population. Folk shows are organized to disseminate malaria prevention knowledge among residents in the endemic village. Demonstrations are made regarding proper usage of LLINs, proper cleaning of net and its use for longer period (apprx. 3 to 4 years). Weekly sensitization meetings are organized among members of GKS to create awareness among community regarding proper usage of net and cleanliness drive like bush cutting and identification of waterlogging areas at these villages with monetary support from GKS. *Bacillus thuringiensis israelensis* (BTI) is sprayed in ponds, streams and water logging areas to kill developing mosquito larvae. Awareness programme to use LLIN is also conducted in school hostels in the hot spot areas. The use of full sleeve dress is promoted to prevent from mosquito bite. Indoor residual spray (IRS) is used in the houses of endemic villages with the support of health workers and GKS members.

Discussion

Every locality has its own setting and environment. The geo-ecological setting of Odisha, particularly Malakanagiri is the most conducive environment for malaria. Social infrastructures

and health human resources are not at required level. The economy is mostly depending on agriculture, livestock and forest products. Besides, to sustain their livelihood, tribes are also working as labourer and also migrate to nearest urban location (both inside and also outside of states) for better job opportunities. The socio-economic, educational, demographic condition of tribal population is low compared to other categories and malnutrition still persists. The indigenous tribal population has their own languages, traditional knowledge and cultural practices. The geographic location (say inaccessibility), poor infrastructures, lack of connectivity, inadequate health man power, low human development indicators and presence of left-wing-extremism are the major reasons for backwardness of these areas. Having all these challenges, the programmatic solution to combat malaria, *Durgam Anchalare Malaria Nirakaran (DAMaN)*, the state government's malaria control programme in the inaccessible areas, supplementation to routine malaria activities plays a crucial role in the reduction of malaria.

The camp approach of DAMaN, a complete package of health care services at door step of residents not only for malaria but also to improve iron supplementation and nutritional support, the first of kind in India reveals that adoption of track, test and treat (3T) method through mass screening and testing (MSAT) using rapid diagnostic kits and treating malaria positive cases through anti-malaria medicine and most importantly its follow-up have improved the coverage of the population and also have reduced the malaria infection. Apart from it, Indoor residual spray (IRS) is the effective vector control measure. Besides, mass distribution of LLINs to every residents and one of the best practice like regular and compulsory usage of bed net at household are the efficient measures to prevent malaria. In addition to, community participatory awareness practices like ringing of bell by ASHA at night and night supervision for regular and compulsory use of bed net and dissemination of various malaria prevention messages and health education through the medium of traditional folk art based methods like folk dance, music, art, street plays, leaflets, posters, banners, advertisements in both print and electronic medias are the effective means of behaviour change communications which gradually change the perspective of usage of LLINs and work as preventive strategy against malaria. Similar studies also highlighted the reasons of reduction of malaria^{2,3,1}. The reduction in malaria cases is due to two important measures i.e. control measures and prevention measures. The scientific tools are used to control the infection whereas preventive measures are based on scientific knowledge dissemination and sustainable practices to prevent the infection. Putting scientific knowledge into practice promotes healthy behaviours and finally improves health seeking behaviours among population. This sustainable knowledge and practice centric approach is a learning experience for both service providers and receivers and has a lasting impact towards malaria elimination.

Lastly, community participation in the form of *gaon kalyan samiti*, local self-government, and community level organizations has played a key role not only in creating awareness but also community mobilization for the effective implementation of the DAMaN. Similar intervention studies were also seen in both India and outside⁶. A well-coordinated team work by both local health authority and field level health workers, especially ASHA, from DAMAN camp to case monitoring to night supervision has checked the malaria infection. Personal interactions like health worker to patient and doctor to patient is one of the effective way of communication in preventing malaria. Besides, inter-departmental convergence among departments of health and family welfare, women and child development and mission shakti, panchayati raj and drinking water, school and mass education, forest and environment, and revenue and disaster

management in micro level is the most meaningful strategy in curbing malaria caseloads. The malaria elimination strategies are implemented by three important pillars of governance like government, involvement of various line departments and community participation in a concerted manner to eliminate malaria.

However, some programmatic deficiencies are visible at ground level. The concerns are loss of LLINs due to tearing, shortage of anti-malaria drugs and RDT kits, sense of fear among health workers due to left wing extremism and difficulty in accessibility to geographical inaccessible areas, incidence of malaria positive cases due to migration from neighbouring border-states. Similar study also found on migrant workers from other parts of India⁷. Besides, reluctance attitude of district level malaria officials during survey is a matter of concern. Bridging these existing deficiencies will improve outcomes and will make malaria elimination a reality. Besides these programmatic deficiencies, the study has some limitations because it does not cover the other part of story which is mostly discussed in the media.

The Way Forward

The study reveals Drugam Anchalre Malaria Nirakaran (DAMaN), the camp approach in supplementation to routine programme of malaria helps in the reduction of malaria in hard-to-reach areas. The success in malaria elimination lies on three important strategies. The first one is using of tools like tracking, testing and treating (3T) to control malaria. The second most important reason is regular and compulsory usage of long lasting insecticidal net (LLIN) to prevent malaria. Last but not the least, acceptance of sustainable community participatory awareness practices for behavioural change shows the path of success in eliminating malaria. The evidence based micro level malaria elimination strategies are based on sustainable knowledge and practice centric approach and support of government and community approach. However, some suggestions are made to strengthen malaria elimination strategies to be more meaningful. The suggestions thus recommend that the frequency of DAMaN camp should be increased from two times to three times in a year to strengthen coverage in inaccessible areas. Besides, both anti-malaria drugs and RDT kits should be sufficiently available with ASHA. Apart from, timely replacement of LLINs is essential where it is used more than years or tore-up. Besides, compulsory maintenance of inter-state migration data with active surveillance mechanism should be developed in panchayat level to reduce incidence of malaria to zero case. In addition to, arrangement of leadership enhance training programme for ASHA, increment of monetary incentives for community health workers and increase in security human resources in the inaccessible areas will motivate local level health workers and enhance their efficiency and security. Further, and most importantly, arrange of folk shows and street plays in tribal language by using the traditional folk art methods like tribal dances, music and musical instruments to disseminate health messages and involve reputed personalities from different field for health literacy campaign. Lastly, developing connectivity to remote and inaccessible areas and building of social infrastructures and recruitment of health human resources and focus on tribal research will help in malaria elimination in future. The lessons learnt from malaria elimination strategies from micro level, will help in achieving malaria free world by 2030 as envisioned by United Nations and World Health Organization. However, besides these micro level strategies, the good practice like use of mosquito net can be taken from Siridi Saibaba's daily rituals as a method of health education for general masses and health education should also be the part of school curriculum.

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