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## Malaria-Need for addressal and Future Challenges

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(Received on 11.08.2016, Accepted on 22.08.2016)

### Abstract

Malaria is a major public health problem around the world. The recent trend shows a reduction in incidence and deaths due to malaria. However it is still a major concern in many countries. World Health Organization (WHO) has framed post-2015 global technical strategy on malaria with newer targets and milestones that have to be achieved by 2020, 2025 and 2030. Universal access to prevention, diagnosis and treatment and effective surveillance are some of the pillars. Government of India launched National Vector Borne Control Program (NVBDCP) in 2005 to consolidate the efforts for prevention and control of vector borne diseases in India. Recently, National malaria strategic plan for malaria control in India, 2012-17 has been framed with revised targets and strategies. To ensure success of these plans and strategies, major hurdles like lack of human resource and funds, limited private sector involvement and lack of political leadership has to be overcome.

**Keywords:** Malaria; Initiatives; Challenges.

### Introduction

Malaria is a protozoal infection caused by four species of the genus *Plasmodium* (*P. vivax*, *P. falciparum*, *P. ovale* and *P. malariae*) and is transmitted by the female anophelid mosquito. It has been a major problem claiming thousands of lives every year in almost all parts of the world. Malaria has serious implications on health of people. It causes significant financial burden and reduced productivity for the affected population. Looking at the diversity of its distribution and presentation, there has been a recent resurgence in interest and

activities for its prevention, control and research by the international community [4].

A number of institutions, policies and guidelines have been created to plan, implement and monitor various strategies for its prevention and control. Reduction in morbidity and mortality due to mosquito borne diseases is important to meet the overall objective of Millennium Development Goals (MDG) and National Health Policy [2]. This article discusses current trend of malaria and newer initiatives that has been taken for malaria prevention and control at national and international level.

### *Current Status of Malaria*

#### *Burden*

As per latest estimates, about 3.2 billion people are at risk of malaria in 97 countries. In the year 2013, the disease killed about 584,000 people mostly children aged under 5 years in sub-Saharan Africa [3]. In the year 2015, there were 214 million new cases of malaria worldwide with 438 000 deaths [4]. While Africa accounts for 90% of the mortality burden for malaria, South-East Asia accounts for 9% of the burden. Out of 11 countries of the World Health Organization South East Asia Region (WHO SEARO), 10 countries are malaria endemic. Morbidity of malaria comprises severe anaemia especially in children and pregnant women, greater prevalence of low birth-weight and development anomalies from residual effects of cerebral malaria. Besides, irregular attendance at school, impaired intellectual development, reduced productivity are some of its indirect effects [5,6].

India is particularly vulnerable to malaria due to epidemics and seasonality. Malaria is concentrated more in rural areas of eastern and north-eastern states. Central and more arid western parts of the

country are also important foci. About 95% population in the country resides in malaria endemic areas and 80% of malaria reported in the country is confined to areas where 20% of population reside in tribal, hilly, hard-to-reach or inaccessible areas [7].

#### *Trend in Malaria Situation*

Between 2001 and 2013, a substantial expansion of malaria control strategies globally, averting an estimated 4.3 million deaths. In the WHO African Region, the malaria mortality rate in children under 5 years of age was reduced by 58% [3]. There has been 37% decrease in malaria incidence globally between 2000 and 2015. There is 60% estimated decrease in global malaria deaths between 2000 and 2015 [4]. Target of Millennium Development Goal 6, namely "Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases", has already been reached, and 55 of the 106 countries

that had malaria transmission in 2000 have almost achieved the goal of reducing malaria incidence by 75% by 2015[8].

#### *Newer Initiatives- International Level*

A number of newer strategies and plans have been framed at international and national level. New targets have been set for coming years to accelerate the progress towards malaria prevention and control efforts.

#### *Global Technical Strategy for Malaria 2016–2030*

WHO has developed a post-2015 global technical strategy on malaria. The vision of this strategy is a world free of malaria. As part of this vision, the strategy sets global targets for 2030 with milestones for measuring progress for 2020 and 2025 as shown in Table 1. Countries can set their own national or sub national targets [8].

**Table 1:** Goals, milestones and targets for global technical strategy for malaria 2016-2030

Vision- A world free of malaria				
S. No.	Goals (taking 2015 as baseline)	Milestones		Targets
		2020	2025	2030
1	Reduce malaria mortality rates globally	Atleast 40%	Atleast 75%	Atleast 90%
2	Reduce malaria case incidence globally	Atleast 40%	Atleast 75%	Atleast 90%
3	Eliminate malaria from countries in which malaria was transmitted	Atleast 10 countries	Atleast 20 countries	Atleast 35 countries
4	Prevent re establishment of malaria in all countries that are malaria free	Re establishment prevented	Re establishment prevented	Re establishment prevented

The strategy has three pillars with two supporting elements to guide the efforts for malaria elimination.

1. Pillar 1 is to ensure universal access to malaria prevention, diagnosis and treatment- A number of interventions are to be promoted. Prevention strategies like vector control, chemoprophylaxis with diagnostic facilities and provision of effective treatment in every public and private health facilities should be ensured.
2. Pillar 2 is to accelerate efforts towards elimination and attainment of malaria-free status. Countries should intensify efforts to reduce the transmission of new infections in defined geographical areas. Interventions that target both vectors and parasite should be focussed. Active case finding and surveillance should be important part of efforts. Innovative technologies and strategies are essential to target

the reservoirs of parasite like addressing insecticide resistance.

3. Pillar 3 is to transform malaria surveillance into a core intervention. Strengthening malaria surveillance is a fundamental requirement for planning and implementation of malaria control program. All countries should have an effective health management and information system (HMIS) for surveillance and monitoring of malaria cases, to detect outbreaks, to assess the impact of preventive and control interventions and to effectively use available resources.

Following indicators have been given to measure the outcome and impact.

#### *Outcome –*

1. Proportion of population at risk who slept under

- an insecticide-treated net the previous night
2. Proportion of population at risk protected by indoor residual spraying within the past 12 months
  3. Proportion of pregnant women who received at least three or more doses of intermittent preventive treatment of malaria while attending antenatal care during their previous pregnancy in sub-Saharan Africa only
  4. Proportion of patients with suspected malaria who receive a parasitological test
  5. Proportion of patients with confirmed malaria who receive first-line anti malarial treatment according to national policy
  6. Proportion of expected health facility reports received at national level
  7. Proportion of malaria cases detected by surveillance systems
  8. Proportion of cases investigated
  9. Proportion of foci investigated

#### *Impact*

1. Parasite prevalence: proportion of the population with evidence of infection with malaria parasites
2. Malaria case incidence: number of confirmed malaria cases per 1000 persons per year
3. Malaria mortality rate: number of malaria deaths per 100 000 persons per year
4. Number of countries that have newly eliminated malaria since 2015
5. Number of countries that were malaria-free in 2015 in which malaria was re-established

Major guiding principles for malaria control and prevention are also given. All countries should accelerate their efforts towards elimination of malaria through variety of interventions which can be modified according to local burden and available resources. Government should lead the efforts with active involvement of communities and other stakeholders. Inter-sectoral coordination is essential to guide the efforts. Improved surveillance, monitoring, evaluation, estimation of disease burden are some important steps required for implementation of malaria interventions. Health services should be available, accessible and affordable especially for the most vulnerable and in difficult geographical areas. Innovation with development of local appropriate technology in tools and approaches is important to enable countries to progress towards malaria.

On 1 January 2016, 17 Sustainable Development Goals (SDGs) of the 2030 Agenda for Sustainable Development came into force. Like MDGs, they also aim to achieve development for all ages and sex. SDG 3 aspires to ensure health and well-being for all, including a bold commitment to end the epidemics of malaria and other communicable diseases by 2030. One of the targets of SDG 3 is to end the epidemics of malaria by 2030 [9].

#### *National Level*

Government of India launched National Vector Borne Control Program (NVBDCP) in 2005 to consolidate the efforts for prevention and control of vector borne diseases in India. Recently, under NVBDCP, National malaria strategic plan for malaria control in India, 2012-17 has been framed [7]. To achieve API < 1 per 1000 Population by the end of 2017 is objective of this plan. The mission statement of this plan is to reduce the morbidity and mortality due to malaria and improving the quality of life, thereby contributing to health and alleviation of poverty in the country.

#### *Following Goals has been Set for this Plan-*

1. Screening all fever cases suspected for malaria (60% through quality microscopy and 40% by Rapid Diagnostic Test)
2. Treating all *P. falciparum* cases with full course of effective Artemisinin Combination Therapy (ACT) and primaquine and all *P. vivax* cases with 3 days chloroquine and 14 days primaquine.
3. Equipping all health Institutions (PHC level and above), especially in high-risk areas, with microscopy facility and Rapid Diagnostic Tests (RDTs) for emergency use and injectable artemisinin derivatives
4. Strengthening all district and sub-district hospitals in malaria endemic areas as per Indian Public Health Standards (IPHS) with facilities for management of severe malaria cases.

#### *Various Outcome Indicators has been Set to Monitor the Implementation*

1. At least 80% of those suffering from malaria get correct, affordable and appropriate and complete treatment within 24 hours of reporting to the health system, by the year 2017
2. At least 80% of those at high risk of malaria get

protected by effective preventive measures such as ITN/LLIN or IRS by 2017

3. At least 10% of the population in high-risk areas is surveyed annually (Annual Blood Examination Rate >10%)

*Following are Impact Indicators for the Plan-*

1. To bring down annual incidence of malaria to less than 1 per 1000 population at national level by 2017.
2. At least 50% reduction in mortality due to malaria by the year 2017, taking 2010 level as baseline

Various strategies which have been opted in the plan are focusing on reforming the program planning and management. Improvement in surveillance and strengthening the monitoring and evaluation would be a priority. Scaling up the coverage and use of insecticide treated bed nets among populations is essential. Targeted interventions to risk groups is major provision in the plan. Use of Artemisinin

Combination Therapy (ACT) and Rapid Diagnostic tests (RDTs) at village level and Integrated Vector Management (IVM) along with Long Lasting Insecticide Treated Bednets (LLIN) use is envisaged. Since incidence of malaria is progressively shrinking in India, under this plan, it is proposed to change the strategies according to malaria endemicity at state and district level.

1. For areas having perennial transmission (more than 5 months in a year) - 2 rounds of Indoor Residual Spray (IRS) with DDT/Synthetic Pyrethroids (SP) or 3 rounds with malathion.
2. For areas having seasonal transmission (less than 5 months in a year) - 1 round of IRS with DDT/ SP or malathion before start of transmission season; focal spray if needed; and priority distribution of LLINs.

For states which are reporting an API of < 1 for three consecutive years, they are to initiate action for declaring malaria as a notifiable disease in the state

**Table 2:** Strategies under National malaria strategic plan for malaria control in India, 2012-17

Category	Definition	Strategies
1	States with API less than 1 and all the districts in the state are with API less than 1	Active, passive and sentinel surveillance Screening of migrants Integrated vector management (IVM) with inter-sectoral coordination Behaviour Change Communication (BCC)
2	States with API less than 1 and one or more districts in the state are with API more than 1	Surveillance and disease management (T3- test, treat and track) Screening of migrants Integrated vector management (IVM) with inter-sectoral coordination Behaviour Change Communication (BCC) with NGOs
3	States with API more than 1	Surveillance and disease management Management of severe malaria by strengthening of district and sub district hospitals and referral services Integrated vector management (IVM) by IRS and LLITNs Supportive interventions

for improved surveillance.

Core interventions and target objectives are as follows-

*For Reducing Disease Burden and Mortality*

Prevention using Insecticide treated mosquito nets would be priority. Objective has been set that by March 2017, 80% of population in high-risk areas sleep under an insecticide treated bed-nets. For Indoor residual spraying, it has been set that by

March 2017, 85% of people living in households eligible for IRS have their homes sprayed annually.

*For care and treatment*, it is proposed that by March 2017, at least 80% of those suffering from malaria get correct, affordable and appropriate diagnosis within 24 hours of reporting to the health system. Also, by March 2017, at least 80% of malaria patients in high-risk areas are receiving prompt and effective treatment according to the current drug policy within 24 hours of reporting to the health system. Intersectoral coordination and public private partnership (PPP)

should be promoted.

PPP can be in form of liaison with international organizations, NGOs, private practitioners and voluntary groups to undertake activities like awareness generation, training of health workers, technical guidance and funding.

#### *Future Challenges*

Shortage of trained manpower and finances will be a major challenge. A number of posts of entomologist, health assistant/supervisors (Male), malaria inspectors and assistant malaria officers and field staff are lying vacant. Lack of money for take up interventions at community levels is a main hurdle. Similarly lack of rapid response teams for outbreak investigations has to be overcome.

Resources available for diagnosis and medicines need to be streamlined so that they are available in all health facilities. Monitoring and evaluation need to be strengthened at all levels. Private sector involvement remains limited.

The above mentioned challenges have to be overcome to meet the targets for malaria control in future. Political will is important to take leadership. Continuous efforts are required for strengthening the malaria control efforts.

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