



## Editorial

### Eliminating malaria in India by 2027: The countdown begins!

Malaria, one of the oldest and deadliest diseases, has had a long and chequered history. In India, the story of malaria made a significant step forward when Roland Ross, a British Army Officer, belonging to the Indian Medical Service, announced on August 27, 1897 that he had established that mosquitoes could transmit malaria by first feeding on a patient with malarial parasite in the blood and then biting an uninfected person<sup>1</sup>. This established the mosquito as a vital link in causing malaria, and awakened public health scientists regarding the possibility of eliminating malaria.

In 1935, it was estimated that India had 100 million malaria cases and one million deaths<sup>2</sup>. An unprecedented degree of success was, however, achieved during the 1950s and early 1960s following the launch of the National Malaria Eradication Programme in 1958. The death toll declined steeply from one million before independence to zero deaths and 0.1 million cases in 1965, virtually eliminating the disease from the country<sup>3,4</sup>. This led to a sense of complacency that the battle against malaria has been won. This and the development of resistance to dichlorodiphenyltrichloroethane (DDT), led thereafter to a resurgence during the early 1970s. In 1975, as many as 6.5 million cases were reported<sup>5</sup>.

In November 2015, the Prime Minister of India joined 17 Asia Pacific leaders in endorsing a plan and roadmap to eliminate malaria throughout the region by 2030<sup>6</sup>. India further pledged to achieve this goal by 2027 - three years ahead of the regional and global target. This, however, may appear a rather daunting task given the complex and dynamic nature of the health problem and the state of public health preparedness in the country.

#### The disease burden

Over the past 15 years, India has made considerable progress in reducing malaria burden. The disease is on

the decline although this has plateaued somewhat over the past few years. During 2017, a total of 842,095 cases and 104 deaths were reported by the National Vector-Borne Disease Control Programme (NVBDCP), the agency responsible for malaria programme in India<sup>7</sup>. However, the World Health Organization (WHO) in its 2017 Global Report cited an estimated 13.1 million cases and 23,990 malarial deaths in India for the same year<sup>8</sup>. The Report claimed that India's malaria surveillance mechanism detected a mere eight per cent of cases.

Nearly 70 per cent of malaria cases in India are contributed by five out of 36 States and Union Territories<sup>9</sup>. These include Odisha (36%), Chhattisgarh (12%), Jharkhand (9%), Madhya Pradesh (9%) and Maharashtra (5%). Historically, the above mentioned States and northeastern States such as Meghalaya, Mizoram, Nagaland, which have a wide coverage of forest, hilly, tribal and conflict-affected areas accounted for the most of malaria burden in the country.

In terms of transmission intensity, as measured by the annual parasite index (API) or the number of cases confirmed to have malaria parasite in their blood per 1000 population, the country can be stratified into four distinct categories: Category 0: no malaria transmission and API of 0 (75 districts), Category 1: limited transmission and API < 1 (448 districts), Category 2: moderate transmission and API 1- < 2 (48 districts) and Category 3: high transmission and API of 2 or more (107 districts)<sup>10</sup>.

#### Elimination plan

With the third highest malaria burden in the world and contributing the largest number of cases (89%) and deaths (90%) in the South-East Asia region<sup>8</sup>, India is an important country in the context of global malaria elimination. Elimination is defined by the WHO as interruption of local transmission or reduction to zero

incidence of indigenous cases of malaria parasite species in a defined geographic area<sup>11</sup>. This goal cannot be achieved in Asia or globally without India making substantial and all-out efforts in this regard.

The Government of India has developed a National Framework for Malaria Elimination (2016-2030)<sup>9</sup> and a National Strategic Plan (NSP, 2017-2022) with the aim to eliminate malaria (zero indigenous cases) in all Category 1 and 2 districts by 2022<sup>10</sup>. In Category 3 or the highest transmission districts, the target is to bring them under a pre-elimination and elimination programme by 2022.

### Essential prerequisites for success

To achieve the goal of malaria elimination in the country by 2027, the following issues need to be addressed urgently:

First, streamline Programme planning and management. The NSP which presently extends only up to 2022 should be expanded to cover the period up to 2027. Moreover, the NSP<sup>10</sup> targets only the low and moderate transmission districts initially, while the elimination efforts in high burden districts will begin only after 2022. Such a timeline will provide only five years for 107 districts to achieve elimination goal. The programme should ideally target all districts including those in the North East right from the beginning for the maximum impact.

While agreeing that the planning and implementation be delegated to the districts, they may, however, need guidance in preparing and implementing a district elimination plan, with targets set and progress reviewed at the end of each year. The role of NVBDCP could therefore include providing technical and supervisory support, ensuring logistic management and help organizing quarterly meeting of districts to review progress and exchange programme experiences. The programme should also ensure that districts which achieve elimination move to the maintenance phase.

Second, transform malaria surveillance. Surveillance is at the heart of the malaria elimination programme, not only for assessing the transmission intensity in each district and thereby stratifying it for interventions but also continuing to monitor impact of interventions. In this context, defining a malaria case or death is an important issue. At present, malaria can only be labelled if a positive blood smear is documented (based upon the WHO

definition of malaria). Therefore, patients who live in a malarious area who though reporting with all the signs and symptoms of malaria and/or have positive rapid diagnostic test (RDT) cannot be labelled as malaria unless a positive blood smear is documented. Moreover, the patients who do not go to the designated health centre or prefer other health system or facilities in public or private sector can not be captured by the surveillance system. In view of this, it may be considered worthwhile to designate malaria as a notifiable disease, thereby making reporting of malaria cases mandatory for all private and public health facilities in the country.

To detect and verify all cases, passive reporting must be supplemented by active search for cases in the community. The suspected cases such as those with fever (if found positive on RDT) can be offered treatment, and at the same time, blood smear is taken for the demonstration of malarial parasite, for surveillance purposes. In actual fact, the modern rapid tests are equally or more sensitive and specific than blood smear. It would be better if the WHO definition of malaria positive be modified to include a recorded positive value on the rapid test.

Monitoring drug resistance is also an area of concern especially in the northeast because resistance to artemisinin-based combination therapy (ACT) has already been detected in India along the Indo-Myanmar border. Drug resistance has been reported for many years in some neighbouring countries such as Myanmar<sup>12</sup>.

Third, fast-track access to the essential package of effective prevention and treatment interventions such as diagnosis through bi-valent rapid diagnosis kits, treatment with ACT+, insecticide-treated bed nets (ITN), insecticidal spraying and larvicidal measures together with Information Education and Communication (IEC) services. No district should begin implementing the elimination plan unless all these interventions are in place. Malaria elimination cannot be achieved without massive scale-up of each and every element of the total package advocated for malaria management in the community. At present, the coverage of these essential interventions remains low and India is the only country in the Region which is reporting coverage of <50 per cent<sup>8</sup>.

Amongst the most effective tools for combating malaria is ACT. In India (except in the northeast

India), the ACT still in use is not an ideal combination as it has an adjuvant or a partner drug namely sulphamethoxazole pyrimethamine. This adjuvant is no longer recommended by WHO (and is not being used by any other country in the Region) because of the history of high failure rates<sup>8</sup>. The policy needs to be changed in favour of right combination, which is effective not only in reducing mortality but also in preventing disease transmission in falciparum malaria<sup>13</sup>.

Fourth, enlist and sustain political commitment including for financial resources. While India has pledged to achieve the goal ahead of the rest of the world, the goal of elimination cannot be achieved without the highest level of political commitment, both in terms of policy and in terms of priority for financial allocation. The financial resources required by the programme is to the tune of ₹106 billion over a period of five years (2017-2022) or more than ₹20 billion per year<sup>11</sup>.

Equally important is the need for human resources. Malaria often occurs in villages and communities and is managed by the health workers at the sub-centre level. The presence of a trained public health specialist at every district could play a vital role in the malaria elimination and other similar programmes. The insufficient number of human resources is an area of grave concern which needs to be addressed without delay.

Finally, ensure full engagement of all stakeholders. No public health intervention can be effective in the absence of community participation. An intensive and sustained IEC campaign and mass contact can help create awareness and mobilize the community and various stakeholders, within and outside government sectors. An open channel of communication and feedback mechanism at all levels of healthcare and amongst various stakeholders is essential. Use of modern technology can help achieve the desired target.

In conclusion, malaria elimination is an ambitious goal requiring the highest level of commitment and a sense of urgency as the target year for elimination is not too faraway. A paradigm shift in revamping the surveillance system, streamlining Programme planning and management decentralized to district levels, embarking on a massive scale-up of a package of effective interventions and finally ensuring adequate investment of financial and human resources shall help.

**Conflicts of Interest:** None.

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