

# Myanmar

## 1. Epidemiological profile

As one of the leading causes of morbidity and mortality, malaria is a major public health problem in Myanmar. The majority of malaria cases and deaths in the GMS occur in this country, which accounts for approximately one-fifth of the Subregion's population. In 2006, Myanmar had 200 679 confirmed cases and 1647 deaths due to malaria.<sup>42</sup>

Historically, malaria morbidity and mortality in Myanmar peaked between 1988 and 1991 as a result of epidemics, widespread population mobility and drug resistance, particularly along the border with Thailand. From 1992 onwards, efforts to improve the coverage of health services by installing more hospitals, rural health centres and sub-rural health centres led to an improvement in the overall malaria situation.<sup>43</sup> Myanmar continued to suffer from outbreaks, having experienced a total of 56 malaria outbreaks between 1991 and 2000, most

of which were sparked by migration.<sup>44</sup> Since 2000, the frequency of malaria outbreaks has decreased.

More recently, as shown in Figures 1 and 2, the number of confirmed cases has risen between 1998 and 2006, while the annual number of deaths attributed to malaria was almost halved over the same period, from 3182 to 1647 deaths. The drop in malaria mortality may be partially attributed to greater private sector provision of artemisinin derivatives. As of 2006, the estimated malaria mortality rate in Myanmar was 2.9 deaths per 100 000 population (down from 6.7 in 1998), while the incidence of confirmed malaria was 3.6 cases per 1000 population (compared to 1.8 in 1998). Possible explanations for the increase in the number of malaria cases are improvements in case finding and reporting systems, as well as the greater movement of migrant workers.<sup>45</sup>

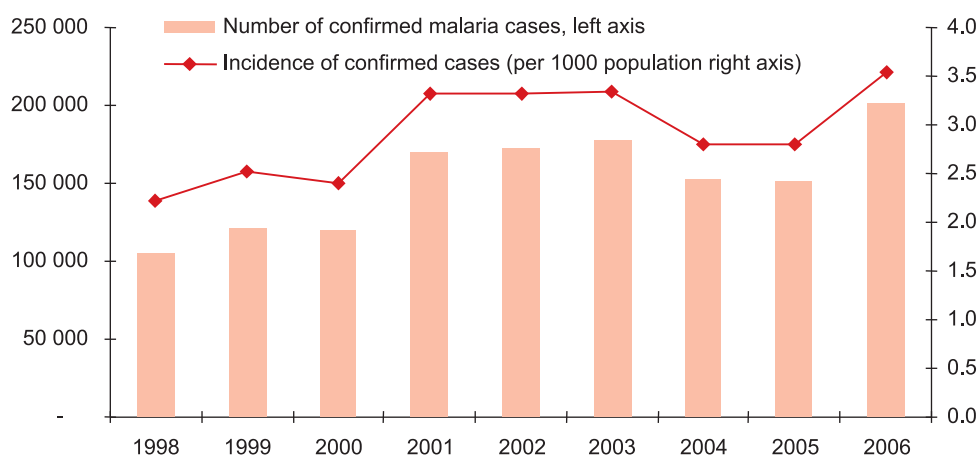
<sup>42</sup> Unless otherwise specified, all data on malaria cases and deaths in this chapter are from the Ministry of Health, Myanmar.

<sup>43</sup> ACTMalaria country profile, Myanmar 2007. [www.actmalaria.net](http://www.actmalaria.net)

<sup>44</sup> WHO Roll Back Malaria. *Myanmar country profile*. 2005.

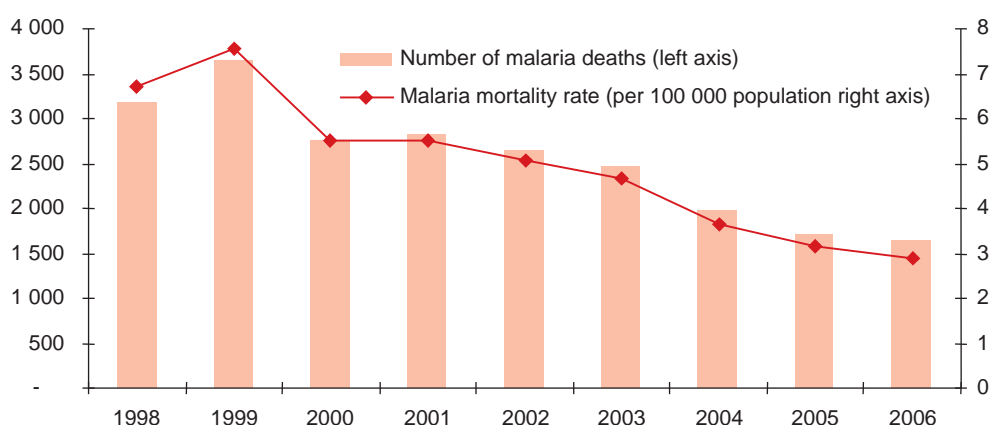
<sup>45</sup> ACTMalaria country profile, Myanmar. [www.actmalaria.net](http://www.actmalaria.net)

**Figure 1: Malaria morbidity in Myanmar, 1998–2006**



Source: National Malaria Control Programme, Myanmar.

**Figure 2: Malaria mortality in Myanmar, 1998–2006**



Source: National Malaria Control Programme, Myanmar.

Malaria is endemic in 284 out of 324 townships.<sup>46</sup> About 60% of the total malaria cases occur in forest or forest fringe areas where the main vectors are *A. dirus* and *A. minimus*. Population groups at high risk of malaria are internal migrants, people who resettle in malaria endemic areas, subsistence farmers in forests and on the forest fringes, and forest workers (loggers, gem-miners

etc.), particularly non-immune migrants working in forested areas.<sup>47</sup>

Within the country, the malaria burden is particularly high in the border areas. As shown in the table above, the highest morbidity rates were recorded in 2006 in Rakhine state on the west coast (54.6 clinical suspected malaria cases per 1000 population). The other provinces that also recorded a high rate of malaria

<sup>46</sup> WHO and Ministry of Health. *Communication and Social Mobilization for Malaria Prevention and Control in Myanmar*. June 2007 (Draft).

<sup>47</sup> WHO Roll Back Malaria. *Myanmar country profile*. 2005.

**Table 1: Suspected malaria cases for selected states and divisions**

11 of 17 states and divisions	2002	2003	2004	2005	2006	% of total suspected malaria cases, 2006	Incidence rate (cases per 1000 population), 2006
Rakhine state	192 937	228 369	189 030	117 793	172 495	32	54.6
Sagaing	99 891	79 238	71 391	72 588	56 953	11	9.3
Northern Shan state	42 764	37 792	33 683	35 209	35 748	7	14.5
Kachin state	43 835	47 118	34 597	38 007	32 088	6	21.7
Taninthayi division	30 915	31 103	32 609	25 426	29 377	5	18.5
Magway	50 480	40 632	30 970	29 779	28 289	5	5.3
Mandalay	44 382	34 201	30 422	24 847	23 480	4	3.0
Chin state	31 161	27 256	23 787	24 720	23 112	4	43.2
Southern Shan state	24 602	26 612	22 555	22 359	21 435	4	10.0
Kayin	20 302	16 963	15 623	21 507	21 071	4	12.3
Ayeyarwaddy	30 726	30 943	27 662	26 353	20 864	4	2.7

Source: National Malaria Control Programme, Myanmar.

cases per 1000 persons are Chin state which borders Bangladesh, Kachin and Northern Shan states on the border with PR China, and Tanintharyi Division which borders Thailand. Rakhine and Shan states, which accounted for the highest number of suspected malaria cases in 2006, also had the most epidemics between 1991 and 2006 (nine and ten epidemics respectively)<sup>48</sup>. The highest mortality rates were recorded in Kayah (on the Thai border) and Kachin states, with 9.4 and 7.8 deaths respectively per 1000 population in 2005.

Factors contributing to high morbidity and mortality in the border areas are the topography and climate conditions that facilitate malaria transmission, compounded by difficult communication in these remote areas, low literacy rates

of ethnic minorities, difficult access to health services, high population mobility and the prevalence of multidrug-resistant *P. falciparum*. The malaria burden may be even greater than these figures suggest, as only approximately 25% to 40% of fever cases utilize public health facilities, and self-treatment or treatment by the private sector are not reported.<sup>49</sup>

## 2. Overview of malaria control activities

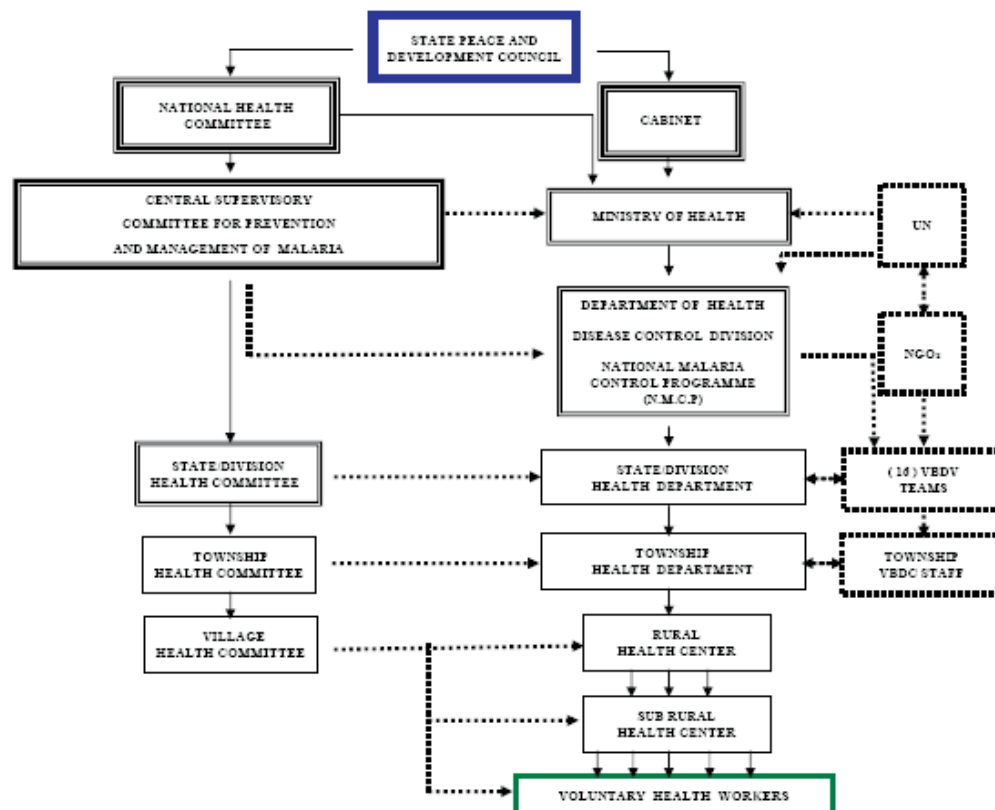
Malaria control in Myanmar has been integrated with basic health services since 1978, and is currently under the responsibility of the Vector Borne Disease Control Programme. National funding for malaria control was US\$ 23 million in 2003.<sup>50</sup> A National Strategic Plan

<sup>48</sup> ACTMalaria country profile, Myanmar, 2008. [www.actmalaria.net](http://www.actmalaria.net)

<sup>49</sup> ACTMalaria country profile, Myanmar, 2007. [www.actmalaria.net](http://www.actmalaria.net)

<sup>50</sup> WHO Roll Back Malaria. *Myanmar country*

**Figure 3: Structure of the National Malaria Control Programme**



2006-2010 has been drafted for malaria control in Myanmar. The plan adopts a multi-pronged approach by combining the following key interventions:

- Case management for early diagnosis and treatment.
- Prevention by insecticide-treated mosquito nets and other vector control methods.
- Malaria surveillance and information systems.
- Information, education and communication (IEC) and social mobilization.

Other important components of the National Malaria Control Programme

are capacity-building of health staff, both pre- and in-service; partnership-building within the Ministry of Health as well as with external partners; community participation, involvement and empowerment; and basic and applied research.

### *Diagnosis and treatment*

A key challenge to effective case management is the lack of laboratory services and proper health facilities in remote, isolated and inaccessible areas. Early diagnosis and treatment is being promoted by expanding diagnostic facilities and providing RDTs and other diagnostic tools to rural health centres

**Table 2: Antimalarial drug policy in Lao PDR**

<i>P. falciparum</i>						<i>P. vivax</i>
Uncomplicated		Treatment failure	Severe malaria	Pregnancy treatment	Pregnancy prevention	Treatment
Unconfirmed	Lab-confirmed					
CQ(3d)	ASU(3d) + MEF(2d) or AL(3d)	QN(7d) + D(7d)	QN(7d) + D(7d) or ASU(7d) + D(7d)	QN(1 <sup>st</sup> trim.) + C/D, ASU + C/D (2 <sup>nd</sup> & 3 <sup>rd</sup> trim.)		CQ + PQ(14d)

and sub-centres in remote areas.<sup>51</sup> In 2006, 700 microscopes were distributed to rural health centres in priority areas.<sup>52</sup> Regarding treatment, artemisinin-based combination therapy has been implemented to treat *P. falciparum* cases since late 2002.

### Vector control

The focus of vector control in Myanmar is on the distribution of ITNs, while IRS is generally limited to the control of epidemics and to development project areas. Target groups for ITN distribution include marginalized communities in remote areas, and pregnant women and children in moderate to high-risk areas.

Approximately 50% of households own mosquito nets, with an average of two nets per household.<sup>53</sup> Mass treatment of nets is scheduled to be carried out

at least once per year. In 2007, it was estimated that 17.4 million persons in Myanmar were covered by treated or untreated mosquito nets, which amounts to 58% of the population at moderate and high risk of malaria.<sup>54</sup>

### Monitoring antimalarial drug efficacy

*P. falciparum* resistance to chloroquine and SP is now widespread in Myanmar, while resistance to mefloquine and quinine is on the rise, particularly on the Myanmar—Thai border.

In this part of the country, the spread of multidrug resistance has been amplified by uncontrolled population movement. The indiscriminate use of antimalarial drugs by private practitioners has also contributed to drug resistance.

<sup>51</sup> WHO and Ministry of Health. *Communication and Social Mobilization for Malaria Prevention and Control in Myanmar*. June 2007 (Draft).

<sup>52</sup> Ibid.

<sup>53</sup> ACTMalaria country profile, Myanmar, 2007. [www.actmalaria.net](http://www.actmalaria.net)

<sup>54</sup> [www.searo.who.int](http://www.searo.who.int). These figures are preliminary, and are based on the following definitions for population at risk: API>10 (high risk), API>1 (moderate risk), and API<1 (low risk).

**Table 3: Efficacy of antimalarial drugs to *P. falciparum*:  
Summary of results, 2006**

Study site	Drug	Year	Dose	Modifications	Quality control	N	ACPR (%)
Kawthaung, Thanintharyi Division (south, on Thai border)	ASU+MEF	2006	ASU 100 mg tab BID x 3 days: Mef 750 mg total single dose: No of tabs based on age group/weight	28 day follow-up	ASU from Mekophar, Viet Nam: MEF from Mepha, Switzerland: Slide validation	34	91.3%
	AL (Coartem®)	2006	20mg Artemether+120 mg lumefantrine (4 tabs BID in adults)	"	AL from Novartis: slide v' alidation	36	91.7%
	ASU+AMO	2006	ASU 2 tabs bid x 3 days + AMO 4 tabs a day for 2 days and 2 tabs on the 3rd day	"	ASU from Mekophar, Viet Nam: AMO from Markers Lab Ltd, India	26	80.8%
Myit Kyinar, Kachin state (north, on Yunnan border)	AL (Coartem®)	2006	20mg Artemether+120 mg lumefantrine (4 tabs BID in adults)	28 day follow-up	AL from Novartis: slide validation	54	96.1%
Chaung Gyi, Mandalay Division (central)	AL (Coartem®)	2006	20mg Artemether+120 mg lumefantrine (4 tabs BID in adults)	28 day follow-up	AL from Novartis: slide validation	55	96.3%
	ASU+AMO	2006	ASU 2 tabs bid x 3 days + AMO 4 tabs a day for 2 days and 2 tabs on the 3rd day	"	ASU from Mekophar, Viet Nam: AMO from Markers Lab Ltd, India	60	96.6%
Patheingyi, Ayeyarwady Division (coastal)	ASU+MEF	2006	ASU 100 mg tab BID x 3 days: Mef 750 mg total single dose: No of tabs based on age group/weight	28 day follow-up	ASU from Mekophar, Viet Nam: MEF from Mepha, Switzerland: Slide validation	47	95.7%
	AL (Coartem®)	2006	20mg Artemether+120 mg lumefantrine (4 tabs BID in adults)	"	AL from Novartis: slide validation	52	96.1%

Study site	Drug	Year	Dose	Modifications	Quality control	N	ACPR (%)
Clinical Research Unit, Defence Services General Hospital, Mingaladon, Yangon	DHA+ Piperaquine (Artekin®)	2005-2006	DHA 40mg+PIP 320mg : total 360 mg = 8 tabs (2 tabs at 0, 8, 24 and 32 hr)	28 day follow-up	Artekin® from Holleykin Pharmaceuticaal Co, Ltd, Guangzhou, China	30	30(100%)
	ASU + Mefloquine (Artequin®)	2005-2006	ASU 600mg+ Mef 1500 mg (combi pack): 1+2 tablets on Days 1, 2, 3	"	Mepha, Switzerland	9	9 (100%)
	DHA+ Piperaquine (Artekin®)	2006	DHA 40mg+PIP 320mg : total 360 mg = 8 tabs (2 tabs at 0, 8, 24 and 32 hr)	"	Artekin® from Holleykin Pharmaceuticaal Co, Ltd, Guangzhou, China	30	30(100%)
	ASU + Amodiaquine (Larimal®)	2006	ASU 200mg + AMO 600 mg	"		26	26(100%)

Source: WHO.