

## Burden of malaria in the Mekong countries

With nearly 1.5 million cases reported annually, with *Plasmodium falciparum* being the dominant species and with the likelihood that there is substantial under-reporting, malaria is a serious disease in the Mekong region.

The burden of disease in the region is gradually changing as shown in Figures 8a and 8b by graphing the malaria situation in the 6 countries over the 6 years, 1996 - 2001. In Figure 8a, the data for each country are plotted on different scales so that the picture for each country is self-contained, whereas in Figure 8b, the data for all countries are plotted on the same scale to permit appropriate comparisons to be made.

The transmission varies from country to country, so that the trends differ over time. In Viet Nam, for example, there has been more than a 2-fold drop in case numbers and in numbers of deaths over the period 1996 - 2001.

Lao PDR has seen a 3-fold drop in the numbers of deaths with a less striking change in numbers of cases in the same time period. Myanmar, with the largest case burden, has seen a fairly steady pattern in terms of both case numbers and of deaths, while China/Yunnan and Thailand have recorded modest falls in both parameters during 2000 - 2001. None of the 6 countries has seen any persistent increase in death rate in the 6-year period.

A summary of the detailed database for the 6 countries in the year 2001 is given in Table 2 using a standardized format that permits direct comparisons. From this, it is evident that the burden of malaria in the region is distributed unevenly. Thus Myanmar has the highest case load and nearly half of the total cases from the region as a whole; it also has the highest number of laboratory-confirmed cases although the proportion of cases confirmed in that country is less than half of total cases recorded there.

Viet Nam and Lao PDR have similar country case loads, but differing death rates. The countries (China/Yunnan, Thailand) that report only laboratory-confirmed malaria cases have the lowest case numbers. This data set enables a start to be made on building an evaluation of the disease burden throughout the region as a whole but it will require additional input of social and economic parameters to more fully assess comparative needs in order to plan resource allocation in that context.

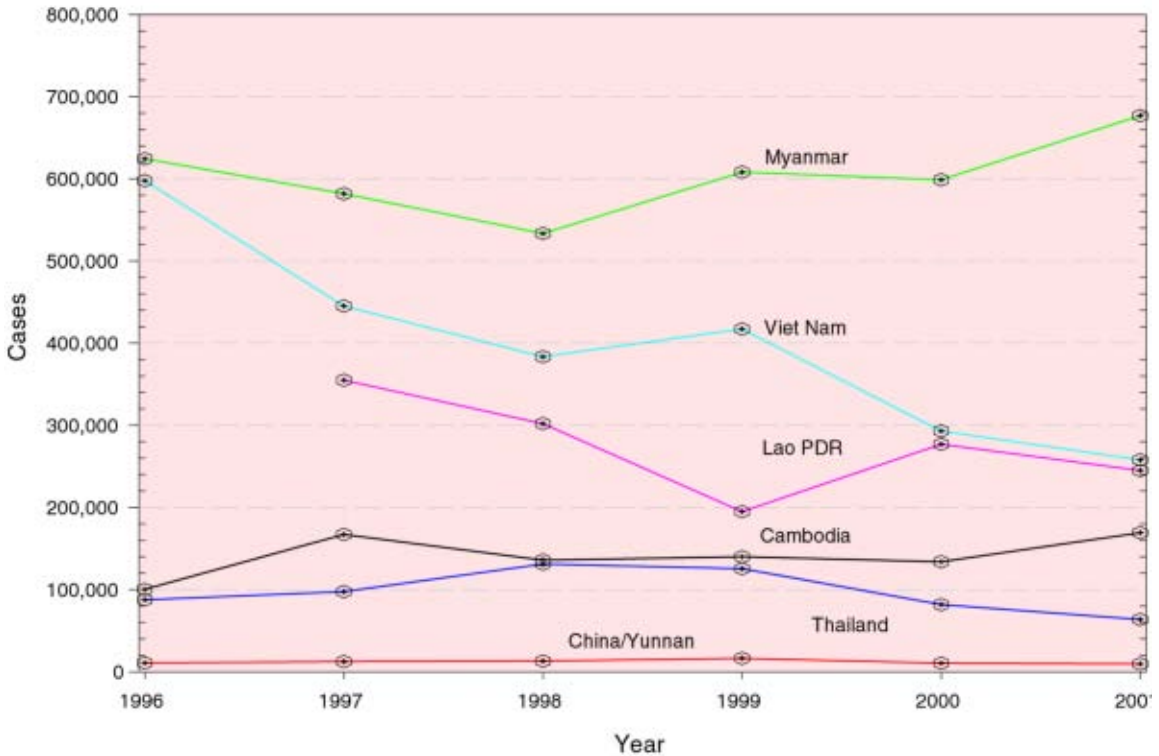
Burden of disease can be quantitatively defined in terms of relative risk with respect to malaria morbidity and mortality. To assess the relative risk in the region, the assessment of

## NUMBER OF CASES AND DEATHS IN MEKONG COUNTRIES 1996 - 2001



Figure 8a

## TREND IN NUMBER OF MALARIA CASES IN MEKONG COUNTRIES 1996-2001



**Figure 8b**

**Note:** Total malaria cases for Cambodia, Lao PDR and Viet Nam also included suspected malaria cases.

what disease incidence should be “expected” in the area is first determined and then the observed incidence is compared with the expected incidence. This approach has been used traditionally for the analysis of counts within administrative boundaries (Table 2).

The expected malaria incidence “ $\mu_i$ ” can be calculated as

$$\mu_i = n_i \left[ \frac{\sum y_i}{\sum n_i} \right]$$

Where  $y_i$  = the observed number of malaria cases in each administrative unit  
 $n_i$  = the number of population in each administrative unit

The relative risk (**RR**) is calculated

$$RR = \frac{y_i}{\mu_i}$$

**Table 2**

Summary of country malaria data in the Mekong region 2001.

Country	Total population	Total cases*	Confirmed cases	% Confirmed cases	Death	<i>Pf</i> cases	% <i>Pf</i>	<i>Pf</i> case fatality rate
Cambodia	12.3	169,215	53,601	31.68	476	49,193	91.78	0.97
China/Yunnan	41.08	9,267	9,267	100.00	21	1,946	21.00	0.23
Lao PDR	5.4	244,821	26,932	11.00	242	25,741	95.58	0.94
Myanmar	51.1	676,777	170,045	25.13	3,109	129,406	76.10	2.40
Thailand	61.2	63,528	63,528	100.00	424	29,061	45.75	1.46
Viet Nam	79.5	257,793	68,699	26.65	91	52,173	75.94	0.17
<b>Total</b>	247.5	1,421,582	392,253	27.59	4,369	287,520	73.30	0.15

**Note:** Total malaria cases for Cambodia, Lao PDR and Viet Nam also included suspected malaria cases.

That the distribution of relative risk of malaria morbidity is remarkably uneven at the administrative unit level throughout the region is evident within and between countries. Thus high spots occur in which the risk is greater than 15-fold, while at the other end of the spectrum large areas have a relative risk less than 1 (Figure 9) compared to the average transmission level in the Mekong region.

The malaria death relative risk similarly shows wide diversity throughout the region (Figure 10), with high risk areas 10 times or more than those in low risk areas. This pattern drives home dramatically the uneven burden of the disease and thus the uneven demands concerning resources that will need to be addressed on a region-wide basis to reduce the risks.

# MALARIA RELATIVE RISK 2001

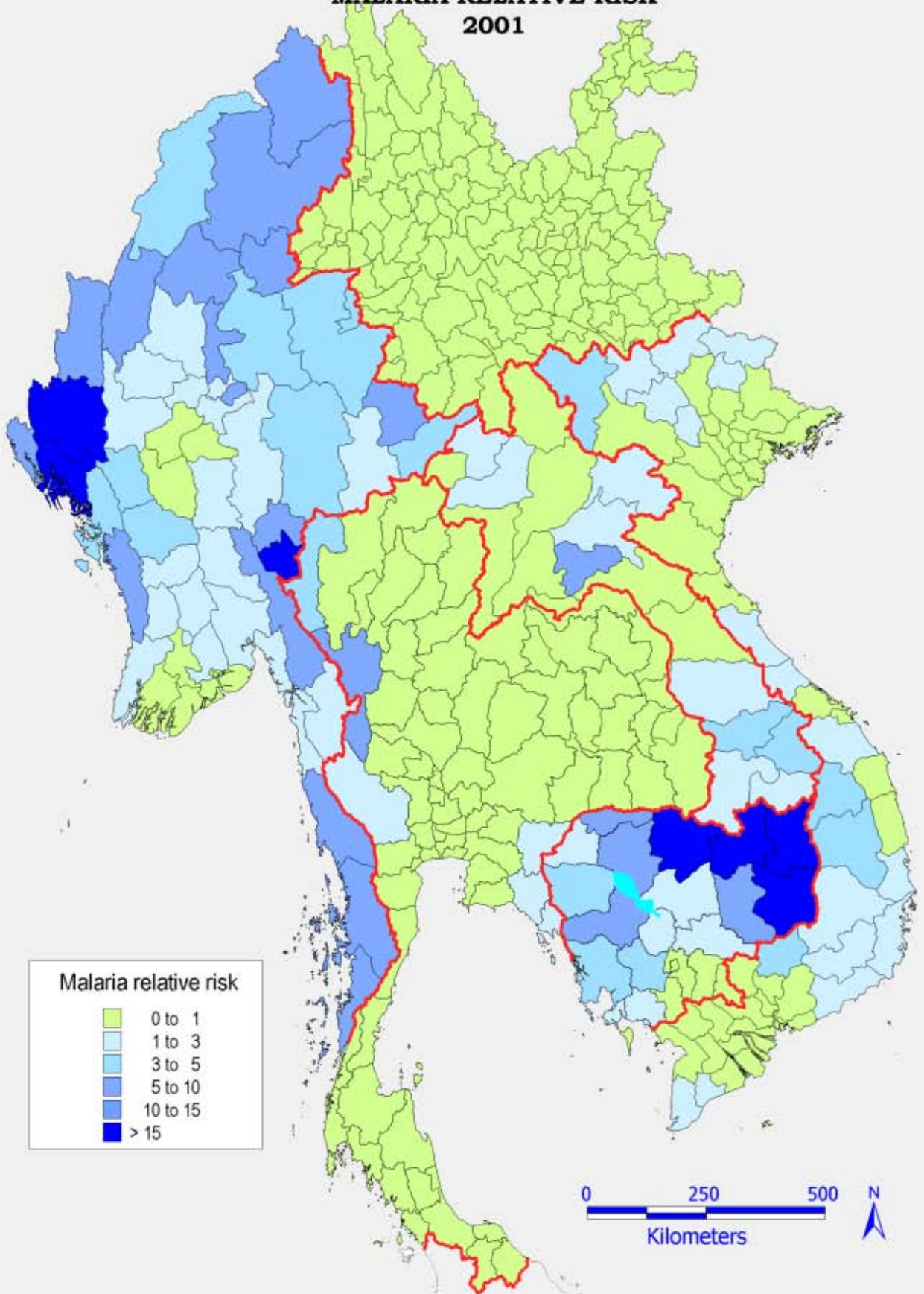


Figure 9

# MALARIA DEATH RELATIVE RISK 2001

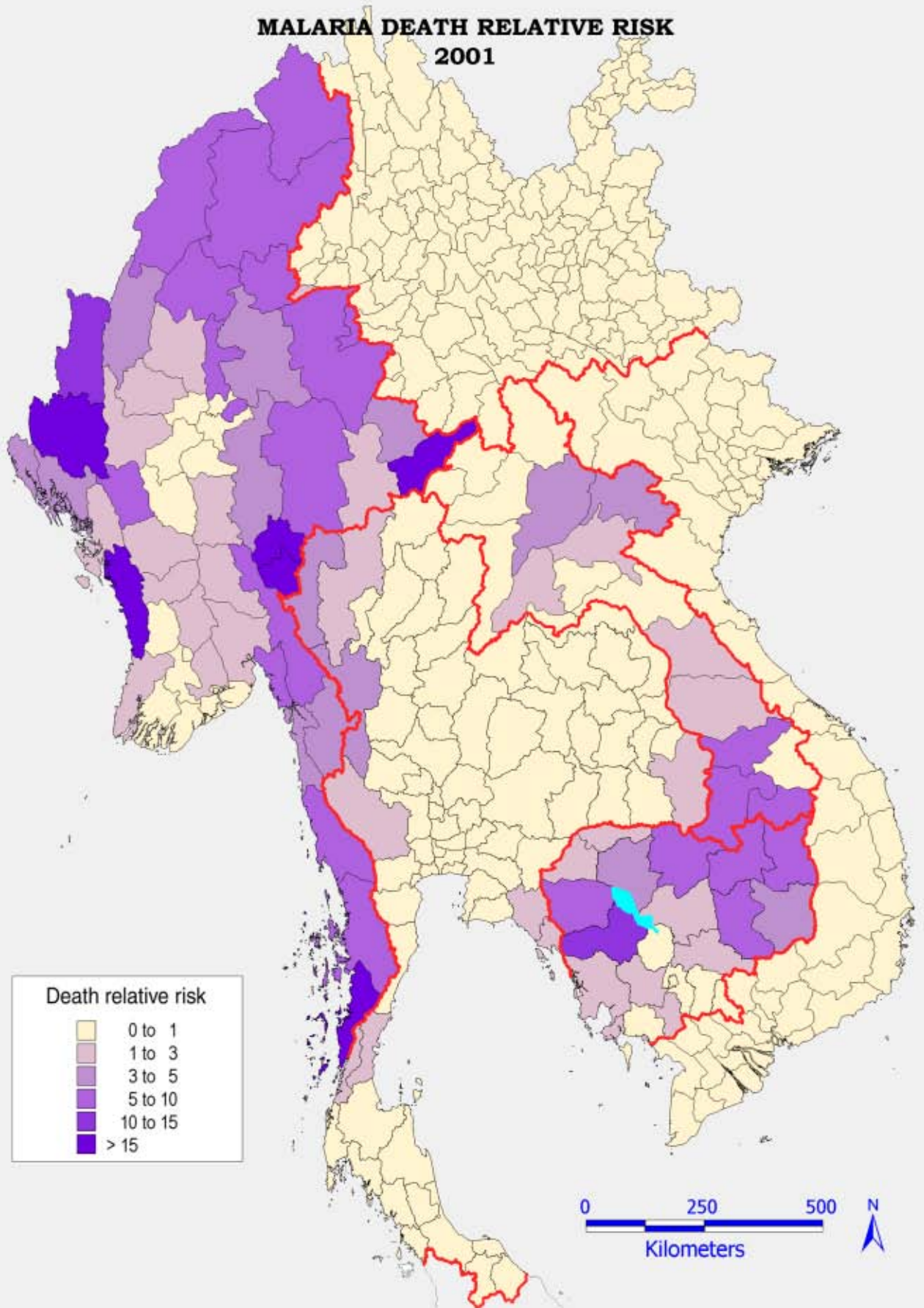


Figure 10