

Malaria distribution and economic status

Mapping of malaria disease patterns provides visual evidence of asymmetry of spatial distribution. This asymmetry can reflect a diversity of geographic/environmental parameters such as forests, fields, topography, water catchments, temperature that affect vector breeding sites. It can reflect human population migration and the accessibility to mosquito vectors of alternative animal hosts.

The disease distribution patterns can also reflect issues such as the allocation of fiscal and human resources within the health sector, budgetary allocation from finance ministry to health and other interrelated sectors, accessibility of patients to health care facilities and hence equity/inequity of transport and communications from one area to another.

Further, asymmetry of disease distribution patterns can be associated with factors such as wealth or poverty of various geographical areas, or with family/per capita income levels within those areas. Personal or family income will affect ability and willingness to pay for direct medical costs, and for indirect costs related to seeking treatment and to income loss during illness.

To undertake such analyses requires microeconomic databases at subnational level (Indaratna and Kidson, 1995). Data of this kind is not commonly available on any regular basis at unit area level as defined here (province, county, district depending on the country concerned). Where some data are indeed accessible at this level, the collection/collation process tends to be carried out less frequently than at yearly intervals, whereas disease data are usually assembled at shorter time intervals so that direct correlation of disease and economic data is not necessarily direct in time frame. Socio-economic data collection is usually done by household survey and may be much less complete than disease data collection. However, both data sets are subject to incomplete sampling and so approximations are inescapable.

There are insufficient subnational data to permit assembly of whole regional patterns at this stage but it is possible to illustrate the potential advantage of combining disease and microeconomic data with a single country example (Thailand, province level) combining 3 years (1996, 1997, 1998) malaria data with a single year's (1998) survey data on per capita income. Considerable disparity in per capita income is apparent, with a clustering of higher income in central and some other provinces, and a clustering of the lowest incomes in northeast provinces (Figure 37). There

is no clear association of malaria with any particular range of per capita income, rather, as previously observed, there is clustering of cases in provinces proximate to international borders.

Now, malaria cases are mapped to the location where the diagnosis is made. There is a high frequency of work-seeking population migration internally within the country, particularly from northeastern to malaria endemic western and southern provinces, as well as to non-endemic central/urban areas. This movement is largely motivated by economic considerations: low income earners moving seasonally or longer term to higher income opportunities.

Since malaria incidence is low in the northeastern provinces, these mobile populations tend to have little or no immunity and are thus more susceptible to severe infection in the areas of higher incidence to which they migrate. In this indirect sense, then, there is a relationship between income per capita and disease liability. Since malaria treatment in the public sector is free to the consumer, direct medical costs are low but accessibility to treatment centers will be subject to limitation by income-dependent capacity to cope with indirect costs of transport and work loss. The latter will be true for both resident populations and for trans-border migrants.

Per capita income has been selected as a microeconomic example here, but other parameters such as per capita Gross Provincial Product, per capita household expenditure can be used to similar effect. Mapping the distribution of health care personnel, hospital beds, insurance coverage and related factors can also provide useful correlations with disease profile (Indaratna *et al*, 1998), providing a basis for resource distribution policy adjustment.

Looking ahead, it would be helpful in planning regional malaria surveillance to access and map microeconomic parameters of these kinds at unit area level in all countries of the region, so to facilitate improved resource allocation, with its implications for concerted cooperative action in disease control.

Data sources: Income data from National Economic and Social Development Board, Thailand; malaria data from health ministry, Thailand.

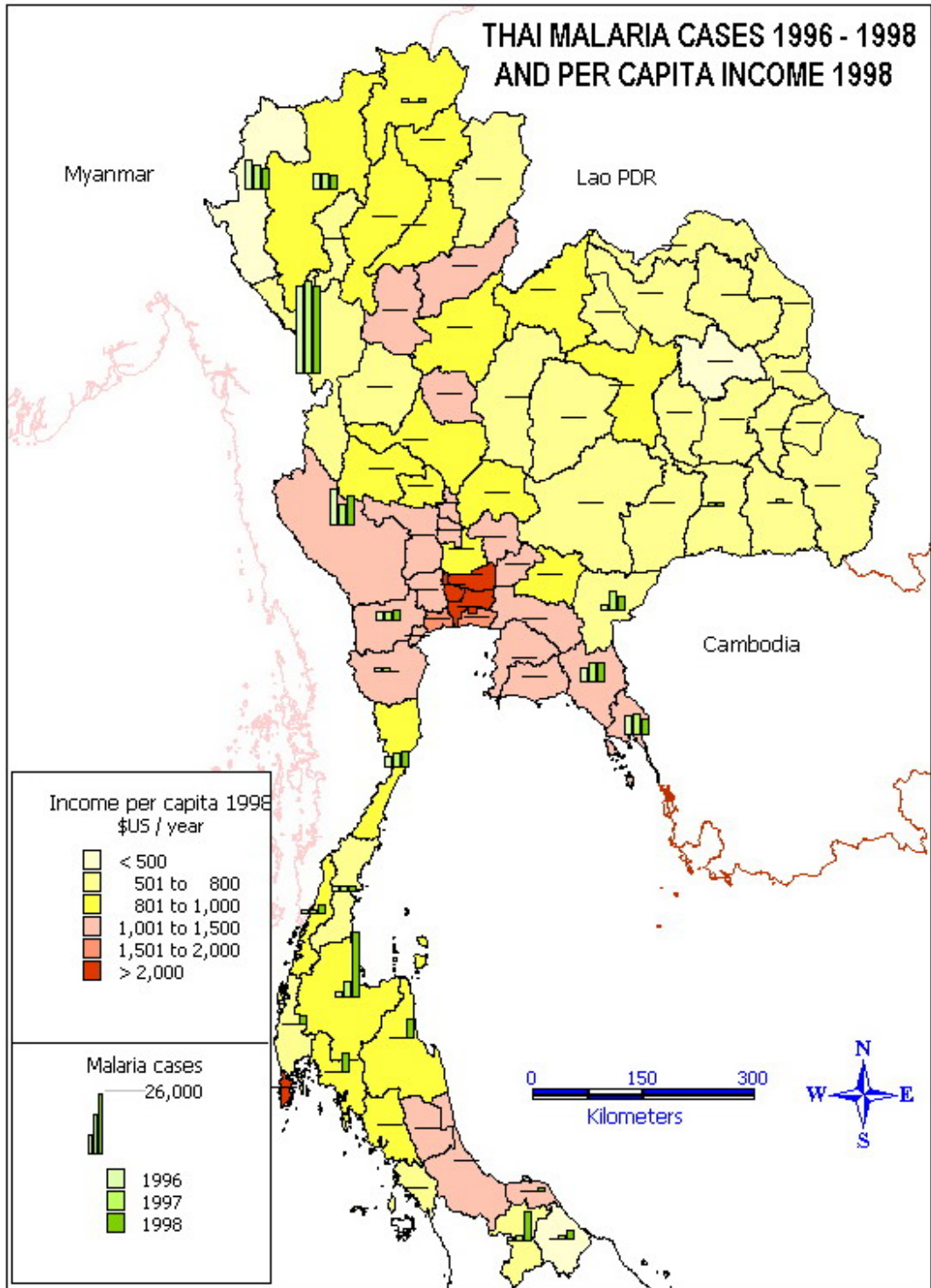


Figure 37.