

## Malaria elimination in Asia–Pacific: an under-told story

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An oft-cited story describes how Sri Lanka reduced its incidence of malaria from 2·8 million cases in 1946 to a mere 17 in 1963, only to see the rate resurge in subsequent years.<sup>1</sup> Yet, in the past decade, Sri Lanka has brought its annual caseload down from more than 200 000 confirmed cases in 2000 to just 428 cases in 2009, with no deaths due to malaria in more than 2 years.<sup>2</sup> Similarly, in the Philippines, the past decade has seen nine provinces become malaria free, bringing the total to 22 of 81.<sup>3</sup> Eight of 20 malaria-endemic countries in WHO's Western Pacific and Southeast Asia regions achieved declines in annual cases of more than 50% from 2000 to 2008.<sup>4</sup> Success stories such as these reverberate throughout Asia–Pacific: in this era of renewed commitment to elimination,<sup>5,6</sup> participants gathered in Kandy, Sri Lanka (Feb 16–19, 2010), for the second annual meeting of the Asia Pacific Malaria Elimination Network (APMEN).<sup>7</sup>

APMEN was launched in February, 2009, in Brisbane, Australia, after a commitment was made by Australian Prime Minister Kevin Rudd at the 2008 UN General Assembly Meeting.<sup>8</sup> The network brings together ten countries—Bhutan, China, North Korea, Indonesia, Malaysia, Philippines, Solomon Islands, South Korea, Sri Lanka, and Vanuatu—that have set a national goal of elimination of malaria, and research institutions and partner agencies in the region, including WHO. Thailand and Goa state in India were also represented in Kandy because of their efforts in sub-national malaria elimination.<sup>9–11</sup>

Delegates at the second APMEN meeting established a firm plan for increased collaboration around advocacy, capacity building, information sharing, and evidence gathering. Activities will be undertaken through an APMEN fellowship programme and working groups in vector control, community participation, and *Plasmodium vivax*, the malaria species that challenges the region. The focus of the group is on elimination and short-term strategies. Most countries in the network have set goals to eliminate malaria within the next 5–10 years. Therefore, they cannot wait for new technologies to be developed, but rather, call for operational research that will inform best use of existing tools. The Australian Agency for International Development has committed substantial funding to support this work and other elimination activities.<sup>12</sup>

Differences between countries in APMEN are notable: populations and land mass range from large to very small; some nations are on the mainland, others are islands; and some are the richest in the world, whereas others are the poorest. Yet, these countries share a vision and plan for elimination of malaria within their borders. They are also faced with the same regional-specific challenges, such as high proportions of *P vivax* infections. A persistent liver stage makes *P vivax* less vulnerable than *Plasmodium falciparum* to elimination efforts,<sup>13</sup> and primaquine,

the only drug available for radical cure, has questionable efficacy, poor compliance, and carries risk of life-threatening haemolysis in patients with underlying deficiency of glucose-6-phosphate dehydrogenase.<sup>14</sup>

Furthermore, *P vivax* can cause large-scale resurgence when control measures are weakened, as happened in 2000–06 in Anhui Province of central China,<sup>15</sup> and in 1993 on the Korean peninsula, where *P vivax* re-emerged after its elimination in the 1970s.<sup>16</sup>

Drug resistance is another difficulty. *P vivax* resistance to chloroquine is widespread,<sup>14</sup> and resistance of *P falciparum* to our best drugs has emerged at the Thai–Cambodia border.<sup>17</sup> Also, by contrast with the situation in Africa, mosquitoes that transmit malaria in Asia–Pacific are often outdoor-biting and resting, making them less vulnerable to traditional vector-control measures such as bednets and indoor residual spraying.<sup>18</sup> Challenges to sustain political will, financial help, and community engagement are other common themes. Lastly, in a region where widespread population movement takes place, countries in APMEN must deal with imported malaria, whether it arises across a land border or from air or sea travel.

Despite the hurdles, countries in Asia–Pacific aiming to eliminate malaria are armed with their experience and knowledge gained from successful control. They can also be encouraged by the achievements of their neighbours. From the 1960s to the 1990s, malaria elimination was achieved and has since been maintained in Brunei, Hong Kong, Maldives, Japan, Singapore, Taiwan, and Aneityum island of Vanuatu.<sup>4,19,20</sup> Not all these places are located in temperate climates, nor were they wealthy when they eliminated malaria against considerable odds, with fewer tools available than today. Many innovative strategies, such as legislation and mass use of primaquine, were implemented, and we can learn from these examples.

Perhaps because of language or cultural barriers, stories of malaria elimination from Asia–Pacific have been under-recognised and under-appreciated within the region and by the international community. APMEN will help to increase cross talk and give a voice to the progress and needs of the region. The network will not only facilitate elimination of malaria in Asia–Pacific but also catalyse and give hope to similar initiatives in other regions of the world.

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