

Entomology and Vector Control for Malaria Elimination in the Asia-Pacific Region

Under the auspices of the Asia Pacific Malaria Elimination Network and Kasetsart University a two-part, four-day regional workshop on entomology and vector control was convened at Kasetsart University, from 7-10 November, 2016. Participants included representatives from nine national malaria control programs, ranging from Pakistan to Papua New Guinea, as well as from academia, development partners, NGOs, bilateral and international organizations and the private sector.

The first two days focused on the strategic shift from 'control' to 'elimination', and comprised three major focus areas commencing with **sharing of best practices for vector control**, such as bed net durability, preference and use studies and insecticide resistance monitoring. A second major theme was the **reorientation of entomological surveillance**, from trapping, identification and mapping, to community-based systems for vector surveillance. Surveillance systems from Sri Lanka were described, as an example of a country that has successfully eliminated malaria. The third major focus area was **capacity-building for public health entomology**, which explored approaches to strengthen Human Resource (HR) capacity, and technical skills in epidemiology and Geographic Information Systems (GIS). Discussions focused on human resource needs and career development; information and knowledge sharing; training needs at national and subnational levels; and institutional, infrastructure and operational research needs.

The second part of the meeting comprised the "Mekong Outdoor Malaria Transmission Network" workshop, with participants expanded to include partners from Industry and private sector vector control services, and additional academic and research institutions control of outdoor and residual malaria transmission. Discussions began with **entomological aspects of outdoor transmission** in the region. Country updates were provided and the **evidence and driving forces** of residual and outdoor transmission were discussed. Sessions covered the **anthropological aspects** of outdoor transmission, including human spatial ecology and available tools, including use of GPS tools, spatial and topical repellents and treated clothing. A panel discussion with the private sector explored the **development and market entry of new tools**, including needs from the public sector in terms of product testing, market projections, and regulatory issues. The final sessions and group work further explored new tool development, the role of large private employers, the WHO framework for moving from proof of concept to implementation; and **review of regional and national regulatory processes**.

Overall, the 3 ½ days of presentation and discussions offered a wealth of information on technical and scientific developments as well as best practices and lessons learned for effective field implementation. The gathering of entomology program leaders from such diverse countries and partners enabled programs to learn from each other about the **necessary shifts in entomological surveillance and vector control strategies to move from malaria 'control' to 'elimination' and strategies to address outdoor transmission**. Inclusion of product development partners provided a unique opportunity to discuss the challenges of innovation to address outdoor and residual malaria transmission: from vectors, human behavior and measuring public health impact, to market size and stability, intellectual property rights, and national regulatory issues.

A common theme throughout both segments of the meeting was the value of networks and mechanisms to allow programs and partners to communicate, share best practices and learn from each other – and the necessity to work across sectors to meet vector control needs. The concluding discussion emphasized **the roles of different partners and programs to ensure continued learning and advancement of entomology and vector control**, as essential components for malaria elimination in the Asia Pacific region.