Emerging Incurable Malaria in Southeast Asia - A Call for Targeted, Decisive Action in the Region

Colin Ohrt1,2, Thang Duc Ngo3, Phuc Phuang Bu4, Cesia Quintero4, Sara Canavati2,4, Jack Richards5, Nam Dinh Nguyen2, William Bertrand2,5, Duong Thanh Tran3

1 Consortium for Health Action, Savage, MN, USA; 2 Vysnova Partners, Inc, Washington DC, USA; 3 National Institute of Malaria Research, Parasitology and Entomology (NIMPE), Ha Noi, Viet Nam; 4 Burnet Institute, Melbourne, Australia; Tulane University, New Orleans, USA.

Background - Current Situation

- Historically, drug resistant strains emerge in Western Cambodia and then spread to Africa (Figure 1).
- The newest strains are not just artemisinin-resistant; they are resistant to nearly all drugs.
- Historically, the spread of chloroquine (CQ)-resistant strains in Africa resulted in a 2-6 fold increase in mortality (2).
- When the new strains spread in Africa, a 2 fold increase would be ~ 8 million deaths over a decade.
- Malaria resurgence will dwarf the highly publicized recent outbreaks from Ebola, SARS and Zika.
- From 2001 to 2015, approximately 6.2 million malaria deaths were averted (3) through massive global investment.
- These impressive gains at risk of being reversed!
- History is repeating itself!!
- Decisive, effective action can and must be taken now!!!

Methods

The published grey literature, strategies, recommendations and M&E reports were critically reviewed. Several multisectoral potential partners in the region were consulted. A very helpful reference was the Regional Artemisinin Initiative (RAI), which is a $100M grant from Global Fund to Cambodia, Laos, Lao PDR, Myanmar, Thailand and Viet Nam from 2014-2016 (4). The mid-term review assessed progress toward the goals of the RAI: “to contribute to the elimination of falciparum malaria in the Greater Mekong Sub-region, and to prevent spread of artemisinin resistance to new areas.” A follow-up interview was conducted with an author of this report. Standard therapeutic efficacy study (TES) are being conducted in the region using 42-day follow-up with directly observed therapy. Lastly, data captured from the US Navy-NIMPE “Enhanced Surveillance and Operations Research” project in Phu Yen and Quang Tri Provinces, Vietnam, in 2015-2016 were analysed and summarized.

Results

- Emergence and spread of P. falciparum (PF) clinical treatment failures with dihydroartemisinin-piperaquine (DHA-PIP)
  - First reports in Cambodia in 2010 (5)
  - Now widespread in Cambodia with PF increasing (4)(Figure 2)
  - First reports in Vietnam in 2015 (4)
  - First published TES report from Vietnam is “in press”
  - Follow-up in Vietnam TES “in progress”
  - Attempts to contain these parasites have failed (4)
  - Decisive, effective action is urgently needed!!

- Highlights from critical review of situation
  - Effective guidelines and recommendations (e.g. regional and national)
  - More detailed documents still needed (e.g. template standard operating procedures)
  - Revision needed to include elimination strategy in malaria “control” areas
  - Effective real time smart phone-based information systems
  - Quality of and effectiveness of standard interventions (e.g. Figure 4)
  - Sufficient, effective funding

Example quality and effectiveness of current interventions (Dong Xuan District, Phu Yen Province Vietnam, blue outline in red circle, figure 3)

Summary of 2015 Findings

- Each household has 2.8 treated nets, 16% use one in risk areas
- 85% say they take any net to the forest, 53% use one
- 85% dislike 2014 “hard” Long Lasting Treated Nets (LLIN)
- RAI hammer nets to 3% of population in 2015.
- Forest goers want treated zip-in hammock nets, none yet provided
- 80% of locations are within one hour of a health center
- Nearly all of these mobile people are accessible

Results (continued)

Example red light-green light system for operations teams to be able to visualize, target and monitor real-time rapid responses and on-going adherence with interventions.

Multi-sectoral participation - Cambodian Army example

- Neglected by donors (6)
- Probably significant MDR malaria transmission reservoir (5,6)
- Potential conduit of disease to Africa during peacekeeping missions (7)
- Must be part of the multi-sectorial collaboration

Multiple donor participation – it should fit the mission of several – GHSA example (8)

- Why isn’t MDR malaria part of the Global Health Security Agenda?
  - It certainly fits the vision: “Our vision is a world safe and secure from global health threats posed by infectious diseases.” (7)
  - It certainly fits most of the action packages driving outcomes: Prevent 1: Antimicrobial Resistance (malaria is a microbe), 2: Immunization (RTSs malaria vaccine may be the most effective tool for prevention). Detect 1: National Laboratory System (Accurate malaria diagnosis is a challenge) 2 3: Real-Time Surveillance (critical for elimination operations) 4: Workforce Development (will absolutely develop effective work forces), Respond 1: Emergency Operations Centers (can absolutely be an opportunity to implement these).
  2: Linking Public Health with Law and Multisectoral Rapid Response (the involvement of several sectors are critical), 3: Medical Countermeasures and Personnel Deployment Action Package (perfect opportunity for a formal going real-world exercise with field epidemiology & laboratory training).
  - Recommend: Revise GHSA and other relevant donor plans to include this current global health threat!!

Conclusions – Specific Recommendations

- Address MDR malaria like the emergency it is!
- In Vietnam, prioritize Binh Phuoc Province as clinical treatment failures to ACTs have crossed borders
- Target transmission foci and mobile/migrant populations who go there (feasible!!)
- Utilize simple cutting-edge smart-phone technology
- Establish the right partners for coordinated action (consortium of executers and funders)
- Encourage participation from all key multisector partners
- Donors with similar mission’s in the region update their plans to help!
- Prepare for the next threat together now!!

References


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Contact information: colin8994@gmail.com +84-126-909-2856