Strategy & Intervention Matrix: Sri Lanka

APMEN asia pacific malaria elimination network

Date of last review: January 2011

Intervention Area	Current Year (2010)	Planned (within next 5 years)
Case Management		
Diagnosis		
National diagnosis policy (confirmed, clinical)	Confirmed diagnosis through microscopy or through rapid diagnosis test kits (RDTs) before treatment	Confirmed diagnosis through microscopy or through rapid diagnosis test kits before treatment; detection of antibodies in cases of clinically treated patients; genotyping of all malaria positive patients
Tools (microscopy, RDT, PCR, parasite genotype, algorithm for clinical diagnosis)	Microscopy primary method, RDT where microscopy unavailable	Microscopy is the gold standard and RDT will be used where there are no microscopists and in emergency situations
Monitoring/QA	Regional Laboratory (district level) collects all slides (positive and negative) from medical institutions, mobile clinics, and RMO patients; all positive slides and 10% of negative slides are sent to Central Laboratory, the national reference laboratory, at AMC Directorate (in Colombo) for rescreening	Same, will continue with the strengthening of central-level cross checking laboratory
Treatment		
P. vivax – 1st line treatment protocol (radical cure, type, unit, dose); contraindicated populations (type, unit dose)	Free treatment for all positive cases; radical cure: mandatory 14d primaquine (0.25 mg/kg daily) with chloroquine (25mg/kg - 3d (divided as 10mg/kg on first and second days, followed by 5mg/kg on 3rd day)); primaquine is contraindicated in pregnant women, infants<1, and G6PD deficiency patients; radical cure of pregnant women and infants should occur six wks after delivery and after one year of age; radical cure of G6PD deficiency through weekly administration of primaquine (dosage of 0.75 mg/kg) with specialized supervision for eight weeks	Same, will continue
P. vivax – 2nd line treatment protocol	Not indicated in Sri Lanka	Not indicated in Sri Lanka
P. falciparum – National treatment protocol/policy (type, unit dose)	Free treatment for positive cases; ACT for all Pf patients (artemether-lumefantrine) and apply DOTs therapy by admitting all Pf patents to a medical institution for 3 days; ban on artemisinin monotherapy; provide single-dose primaquine for anti-gametocidal effect	Same

P. falciparum – Complicated Malaria	IV Quinine initially and then revert to oral Artemether-lumefantrine and primaquine as a stat dose	Same
Mixed infections – National treatment protocol/policy (type, unit dose)	ACT (artemether-lumefantrine) followed by primaquine for 14 days with direct observation in ward for minimum of three days; blood smears taken at intervals to assess ACT efficacy	Same
Directly Observed Therapy (DOT) and Case Follow-up (drug adherence)	All *P. falciparum* patients are admitted into medical institution and receive treatment under supervision for three days minimum; "specialized supervision" of G6PD deficiency during administration of primaquine for 8 weeks; Pf follow up similar as previous years - 28 days (7, 14, 21, 28); due to change in protocol towards elimination, Pv follow-up is now 28 days (7, 14, 21, 28); drug compliance ensured through case follow up procedures. Patients from security forces are kept for 14 days in the camps itself to ensure 100% compliance with treatment	Same
G6PD screening	No screening done before treatment with PQ as the prevalence of G6PD deficiency is <than 1% in Sri Lanka (at present)	Same
G6PD prevalence survey	National prevalence estimated at 1%; 1988 study showed national prevalence of 2.97%	
Mass screening & treatment/Focal screening	MST in past (2000) was discontinued;	Focal screening may be used to find parasite reservoirs, particularly in armed services; mass screening was done in selected previously malaria endemic districts to detect asymptomatic patients and to clear parasite reservoir
Focused Mass Drug Administration (MDA)	Not done	Not done and not indicated
Monitoring/QA	Blood smears taken at intervals to assess the efficacy of treatment in all positive patients	Same
<u>Chemoprophylaxis</u>		
Prophylaxis - travellers	Free prophylaxis given to travellers to Brazil, Thailand border areas, Africa and India.	Partnering with Army & Police Medical Services; provide chemoprophylaxis to all soldiers and policemen on UN missions
Prophylaxis – high risk populations	Not indicated due to low incidence	Same

Prophylaxis – pregnant women	While AMC HQ no longer recommends prophylaxis chloroquine for pregnant women, some districts still prescribing it depending on the risk of acquiring malaria in a given locality	Same
Intermittent Preventive Treatment – infants (IPTi), Children (IPTc) or in Pregnancy (IPTp)	Not indicated	Not indicated
Prevention		
Vector Control		
IRS Strategy (e.g., spatial or temporal rotation)	IRS in all endemic areas; spatial rotation of insecticides	Same
Insecticides	Organophosphate: Fenitrothion; Pyrethroids: Lambda cyhalothrin (ICON), Deltamethrin, Etofenprox, Bifenthrin, Cyfluthrin	Same
LLIN	Distribution of LLIN to high-risk populations in GFATM-funded districts	Starting in 2010-2011, moving toward universal distribution and higher coverage rate
Expired LLIN collection & replacement	None planned	None planned
ITN (and insecticides used)	ITN no longer distributed or retreated as focus is on LLIN distribution	Same
Larval control & environmental modification	Breeding and introduction of larvivorous fish and chemical larviciding in high risk areas; environmental modification includes small-scale filling of abandoned gem-mining pits	Same
QA	Some districts collect information on each LLIN recipient and monitor use; IRS activities reported and supervised; larval control & environmental modification have weak monitoring	Monitor use of LLIN, monitor susceptibility to insecticides, bio assays
Other		
Advocacy & Education		
Mass media	TV spots and radio programs on importance of malaria control	Same
IEC/BCC campaigns	National IEC campaign with no specific target group (supported by GFATM): tools include calendars, leaflets, and hoardings	Introduction of Communication for Behavioral Impact (COMBI) for improving effective diagnosis, treatment, and chemoprophylaxis; COMBI for improving acceptance and usage of bed nets and other vector control interventions; planning advocacy for prevention of

		transmission in developmental activities
Community-based interventions	Increase public awareness of malaria elimination through "Malaria Day" events	Establish and sustain national, provincial, and district working groups for malaria control with clear plan of action; increase public awareness of malaria elimination through "Malaria Day" events
Surveillance		
Case detection and reporting		
Case reporting system	24-hour case reporting is currently in place; transition underway in 2010 from a paper- to internet-based case reporting data management system; Regional Malaria Offices collect information and report to the Directorate with one person in each district charged with notification from the private sector; will install toll-free reporting line and distribute notification form to private hospitals	Online case reporting system, 24 hour report; toll free reporting system from the private sector
Active case detection (ACD)	Mobile malaria clinics (in all at-risk districts) targeting cultivators, gem-miners, refugees, soldiers, and people working in jungle timber-felling	Same; conducting MMC in remote inaccessible areas; conducting mass blood screening to clear hidden parasite reservoirs.
Passive case detection (PCD)	"Activated Passive Case Detection" is a form of passive case detection in which malaria-only diagnostic centers screen and treat patients at public outpatient departments; only probable malaria cases are screened, not all febrile patients; Regional Malaria Offices also provide screening and treatment for patients accessing their services	Same
Case investigation or "re-active surveillance"	Case investigation occurs for each confirmed case; patient contact information, medical and travel history is recorded	A thorough case investigation is done by Regional Malaria Officers and information regarding parasitological, epidemiological, entomological and travel history will be obtained
Other surveillance (e.g., screening, prevalence surveys)	Introduction of PCR for screening blood bank supplies	Antibody testing of all clinically treated patients
Outbreak (Epidemic) detection and response		
Outbreak/Epidemic Prediction & Response	Vector densities from entomological surveys and case reports identify potential outbreak areas; mobile malaria	Establishment of national and district-level rapid response teams for containment of

	clinics screen identified risk areas and focal IRS is applied	outbreaks; ensure availability of buffer stocks of antimalarials, including ACT and insecticides for IRS; establishment of a web-based Malaria Elimination Database
Entomological Surveillance		
Surveillance vector species, behaviour, or densities	Monthly entomological surveillance at district and Directorate-level includes different sites each month with measures of cattle and human-baited collection, window trap collection, and larval surveys	Same
Resistance monitoring		
Insecticide and drug resistance activities	Monthly entomological resistance surveillance at district and Directorate-level includes measures of resistance (Susceptibility Test, Bio Assay, Net Bio Assay)	Maintain database on insecticide susceptibility status and insecticide usage, and database on drug resistance to guide national treatment policy
Drug efficacy	Drug efficacy is monitored through case follow up procedures for Pf and Pv	Same
Prevention of reintroduction		
High risk populations	Army and police personnel and UN security forces	
Border screening		Introduction of legislation for screening people entering country from malarious areas, including a screening program at Bandaranaike International Airport (Colombo) for travellers arriving from malarious areas starting in 2011; set up and maintain 2 sign boards at the airport and at two major harbours; screening of all army personnel returning to SL after UN missions at the airport; develop a containment strategy for imported malaria
Cross border collaborations		Not relevant
Vector-control specific POR activities		
Program management and health systems		
Program Finance		
National elimination goal (by province, district)		Elimination of *P. falciparum* from entire country by the end of 2012, *P. vivax* by the end of 2014

Funding sources and funding budget from each source	Total national budget: $6.6 million (USD) Global Fund: $6.5 million (USD) World Health Organization: $25,000 (USD)	
Stratification		
Stratification strategies for defining risk areas, to allocate resources & activities (tools may include sampling strategy, population-based statistics, GIS)	Risk areas for implementing vector control activities are based on caseload (preceding 2-3years) and entomological field investigations (in particular, vector density)	GIS mapping and corresponding database will be used to identify localities of cases with spatial analyses to be conducted for forecasting of possible outbreaks, target interventions, and identify locations of health care providers
Management		
Program management		
Procurement & supply management		
Financial management		
Program integration		
Level of integration of malaria elimination into public health	Since 1979, the National Malaria Control Programme was decentralised, and provinces and districts are responsible for carrying out malaria control activities in respective areas. The AMC provides technical guidance, purchase critical equipments	Same
Personnel		
Reorientation, retraining, or restaffing & capacity development	Reorientation of private and public health sector staff toward elimination (included training for district staff); trainings for doctors, Army health staff, Anti-Malaria Campaign Directorate staff (Colombo), and Regional Malaria Officers technical staff	Through GFATM R8, in some districts, recruitment of additional staff to provincial malaria program, specifically microscopists, entomologist field assistants, and labourers for vector control activities; training of district-level staff on GIS
Legal Framework		
Frameworks/policies/regulation/strategic plans	National Strategic Plan for Elimination 2008-2012 not yet updated to reflect the end of the national conflict in May 2009	Develop a containment strategy for imported malaria and update of the National Strategic Plan
Standard Operating Procedures (SOP) – list subject		
Private sector – Providers		
Engagement with formal providers (case management,	New engagement with formal providers on case reporting	Workshops with microscopists/lab

reporting, other)	system with roll-out of case report toll-free hotline and education and awareness campaign on importance of reporting for clinicians	technicians in private sector on malaria diagnosis in low burden context with new manual and standardized slides
Engagement with informal providers (case management, reporting, other)		
Training	Re-orient private sector health staff toward new goals of malaria elimination	Refresher training programmes for Laboratory Technicians (MLTs) on malaria diagnosis
Other	Private sector is experienced in reaching out to "hard to reach" populations, especially in previous conflict and transition zones	
Monitoring and QA		
Private sector – Companies/Businesses		
Employee or community programs (e.g., medical services, bed net campaigns)		None
Partners		
Funding	Global Fund, WHO	**GFATM, WHO**
Implementation (list partners and type of collaboration)	Sarvodaya (Sri Lankan NGO): LLIN dstribution, participates in awareness programmes and distribution of health education materials; TEDHA – participates in parasitological and entomological surveillance in the districts of eastern province and in Mannar district in the northern province	Sarvodaya and TEDHA will continue to do the same activities in given districts
M&E		
M&E Elimination Plan, indicator development	Elimination M&E plan in development, with consultation from Swiss TPH organization	Implementation of M&E plan
QA/QC (diagnosis, supply chain, etc)	Supply chain - ACTs should be available in medical institutions. If not, available from AMC HQ or Regional Offices of AMC	Same
Other		

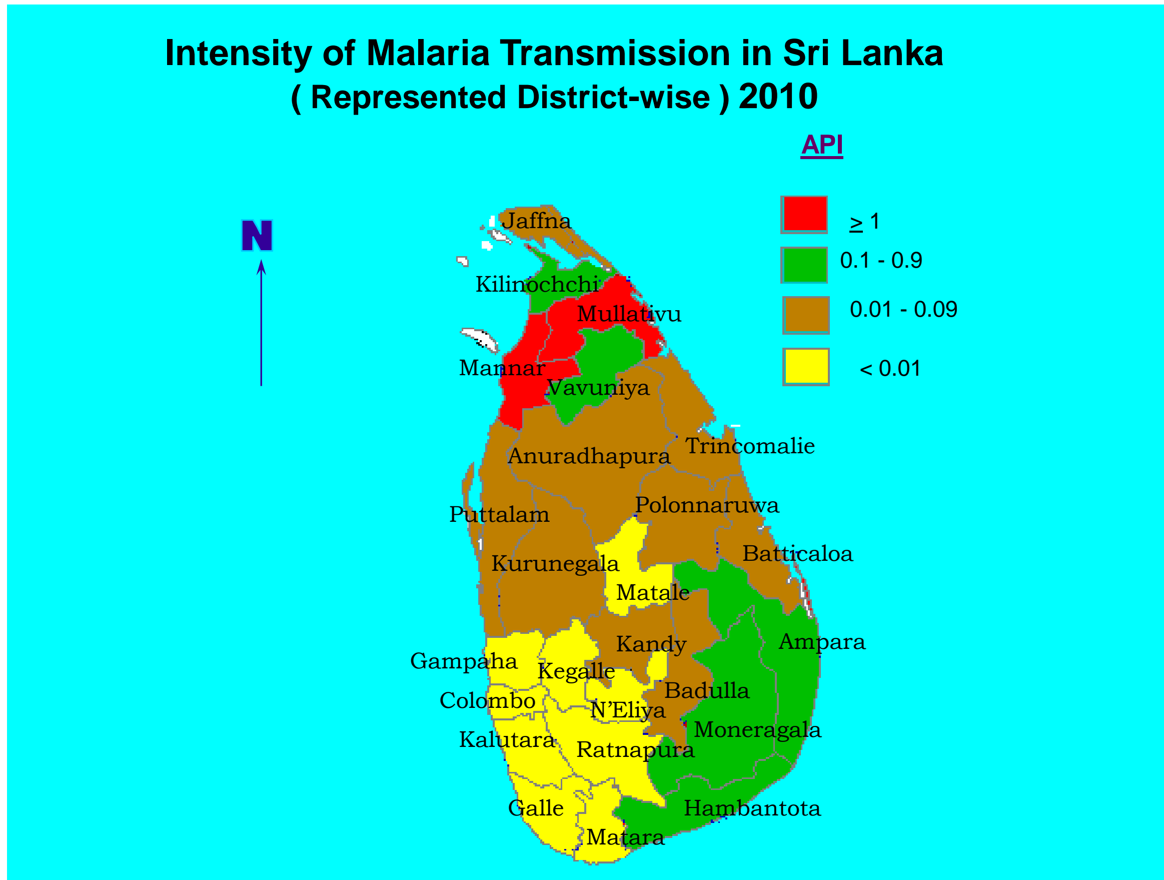
Operational Research	***Research in Past 5-10 years***	***Present Research Projects***	***Planned Research Projects***
Parasitological research projects, in particular for *P. vivax*; list major outcomes and please cite publications when relevant			
Entomological research projects; list major outcomes and please cite publications when relevant			
Behavioural research projects; list major outcomes and please cite publications when relevant			
Other research projects; list major outcomes and please cite publications when relevant			
Research Partners (national, regional and international) in operational research projects			

Quantitative Data

Variable	**Data**	**Source**	**Notes (include year if not 2010)**
Total population	20,237,731	World Health Organization. World Malaria Report 2010	2009
Population at risk (PAR): Low Medium High	4,654,678 NA 0	World Health Organization (2010). World Malaria Report 2010	2009
Total malaria deaths, Total estimated deaths	0	Sri Lanka Anti-Malaria Campaign, personnel communication by G. Galappaththy	2010
Total malaria cases	684	Sri Lanka Anti-Malaria Campaign, personnel communication by G. Galappaththy	2010
Total positive slides – *P. vivax*	668	Sri Lanka Anti-Malaria Campaign, personnel communication by G. Galappaththy	2010
Total positive slides – *P. falciparum*	16	Sri Lanka Anti-Malaria Campaign, personnel communication by G. Galappaththy	2010

Total suspected cases	NA		
G6PD deficiency % population	1-3%	Fernando WP, Ratnapala PR. Report on Research Project Funded by the International Science and Technology Institute, A survey to ascertain the prevalence of G-6-PD enzyme deficiency in Sri Lanka, and its geographical and ethnical distribution. International Science and Technology Institute, 1988.	1988 study
# imported malaria cases (national)	52	Sri Lanka Anti-Malaria Campaign, personnel communication by G. Galappaththy	2010
Slide positivity rate (SPR)	0.07	Sri Lanka Anti-Malaria Campaign, , personnel communication by G. Galappaththy	2010
Annual blood examination rate (ABER)	20.5	Personnel communication by G. Galappaththy	2010
Annual parasite index (API)	0.14	Personnel communication by G. Galappaththy	2010 per 1,000 population at risk
Parasite prevalence rate			

Main Sources
1. Sri Lanka Anti-Malaria Campaign, Ministry of Health (2009-2010). Unpublished data from electronic and hard copy files.
2.Sri Lanka Anti-Malaria Campaign (2008). Strategic Plan for Elimination of Malaria 2008-2012. Anti-Malaria Campaign, Ministry of Health, Sri Lanka.
3.Global Fund to Fights AIDS, Tuberculosis and Malaria. Round 8 Grant Proposal for Malaria.
4. World Health Organization (2010). World Malaria Report 2010. World Health Organization: WHO Global Malaria Programme.
5. Office of the Director General of Health Services. General Circular No. 01-14/2008: Guidelines for Malaria Chemotherapy and the management of patients with malaria. Colombo: Ministry of Health, 2008.
6. World Bank databank. http://databank.worldbank.org/ddp/home.do?Step=1&id=4.



Annual Parasite Incidence in Sri Lanka (per 1,000 population at risk), 2010