Cambodia Malaria Elimination Action Framework

Summary by Alec Georgoff

Cambodia plans to achieve elimination of:

- *Plasmodium falciparum* malaria by 2020
- *Plasmodium vivax* malaria by 2025

In the past decade:

- Number of reported malaria cases cut from 113,855 (*2004*) to 56,271 (*2014*)
- Overall malaria mortality rate decreased from 0.98 per 100,000 (*2010*) to 0.12 per 100,000 (*2014*)

Malaria transmission is still epidemic in 21/25 provinces

Northeast region still accounts for over 70% of the malaria burden

Goal: Reduce incidence of malaria to < 1 infection per 1000 people at risk in each operational district (OD)

Goal: Eliminate *Plasmodium falciparum* including multidrug resistance by 2020

The malaria situation in Cambodia is **heterogeneous**, so ODs are placed in four strata:

- Elimination-targeted
- Transitional
- Burden Reduction
- Non-endemic

CNM will aggressively pursue elimination in *low-endemic* areas while strengthening interventions to reduce the burden of disease in *moderate* and *high transmission* areas

Country Profile

Neighbors

- Thailand (West/North)
- Laos (North)
- Vietnam (East/Southeast)

Socio-Political System

25 provinces, 4 municipalities

Province --> District --> Commune

Municipality --> Section --> Quarter

Multi-party democracy under a constitutional monarchy

Prime Minister: Hun Sen (Cambodian People's Party)

King: Norodom Sihamoni

Demographics

Population: ~15 million people

~90% of population is Khmer

Official language is Khmer

Primary religion is Buddhism

Environment and Climate

Percentage of Cambodia covered in forest has fallen from ~72% in 1973 to ~46% in 2013

At least 32% of the land is classified as agricultural

Health Systems Analysis

Communicable diseases account for 83% of reported disease burden

Main objective in health sector reform is to improve and extend primary health services through implementation of the operational districts (OD) system

Provincial health departments (PHDs) are the link between MOH and ODs

Barriers to accessing services in the public health sector include:

- Distance and rising costs of transport
- Restricted opening hours at government facilities
- Probability of encountering long wait times

Malaria Situational Analysis

2000: ACTs introduced at national scale, extended access to insecticide treated bed nets (ITNs)

2004: CNM piloted the village malaria worker (VMW) program

2006: Initial evidence of artemisinin resistance

National Strategic Plan for Elimination of Malaria in the Kingdom of Cambodia:

- **Short-term (by 2015)**: To move towards pre-elimination of malaria across Cambodia with special efforts to contain artemisinin resistant P. falciparum malaria
- **Medium-term (by 2020)**: To move towards elimination of malaria across Cambodia with an initial focus on P. falciparum malaria and ensure zero deaths from malaria
- **Long-term (by 2025)**: To achieve phased elimination of all forms of malaria in Cambodia

Epidemiological Profile

Parasites

Until 2011, P. falciparum was the predominant species

In 2012, P. vivax accounted for the majority of cases for the first time

Vectors

25 malaria vector species have been identified in Cambodia

Malaria Transmission

Endemic in 21/25 provinces

Incidence is highest in the northeastern part of the country

Transmission occurs primarily in the hot and rainy season between July and November

Prevalence (as measured by PCR) was highest among forest-goers (5.4%) and travelers (2.2%)

Current Situation and Trends

Morbidity and Mortality

In the first 7 months of 2015, confirmed cases have risen by 36% compared to same period in 2014

Overall case load doesn't include those treated by private sector, believed to treat up to 2/3 of patients

Up to 60% of antimalarials are sold or distributed throughout the private sector

Cambodia implemented *public-private mix (PPM)* program, licensing certain health providers

Data from **unlicensed** outlets that provide malaria services is not captured, so number of total cases is an underestimate

8 ODs accounted for 73% of cases treated

Combined population of 1.8 million (12% of total population)

Case load is primarily concentrated in adult males

Multi-Drug Resistance

No alternative antimalarial medicine available with same level of efficacy and tolerability as ACTs

Dihydroartemisinin-piperaquine (DHA-PPQ) is current first-line treatment, except in provinces with DHQ-PPQ failure, where artesunate-mefloquine (AS-MQ) is used

Program Organization, Management, and Performance

National Malaria Program Organization

CNM has evolved from a vertical program to a more administratively decentralized and integrated program within the Cambodian public health system

Providers in public health system:

- Referral hospitals (RH)
- HCs and Health Posts
    - Minimum level services for rural populations, cover 10,000-20,000 people each
- Community health volunteers/workers

Public-Private Mix (PPM) Program - licensed private sectors are enrolled, trained, and monitored for malaria case management services and case load reporting

CNM Structure

Divided into three main bureaus: **technical**, **financial**, and **administrative**

Technical Bureau

- Oversees treatment, training, and supervision
- Twelve technical units:
    - Entomology
    - Epidemiology
    - Research
    - Vector Control

        - Monitoring and Evaluation
        - Laboratory
        - Health Education
        - IT
        - Helminthiasis
        - Filariasis
        - PPM
        - Village Malaria Workers

Administration Bureau

- Responsible for administration including personnel and logistics management
- Six units:
    - Administration
    - Transportation
    - Procurement
    - Library
    - Security
    - Cleaning

Finance Bureau

- Manages all financial matters including donor supported grants and projects
- Three units:
    - Accounting
    - Planning and Materials
    - Financial Services Unit

Program Performance

Government supports decentralization of health activities to the peripheral level

Low salaries and capacity within staff are significant challenges

Coordination remains a challenge

Strategic Plan

Guiding Principles:

- Political commitment, leadership and ownership
- Equity in access to services, especially for the most vulnerable and other underserved populations at risk of malaria
- Improvement of performance of health services
- Innovative tools and approach
- Community participation
- Inter-sectoral approach

GOAL: Reduce the incidence of malaria to less than 1 infection per 1000 people at risk in each operational district and eliminate Plasmodium falciparum including multidrug resistance by 2020

Specific objectives:

1. Providing effective program management and coordination at all levels by 2017 to efficiently deliver a combination of targeted interventions for malaria elimination
2. Achieve universal coverage of case management services by 2016 to ensure 100% parasitological diagnosis of all suspected cases and effective treatment of all confirmed cases
3. Protect at least 90% of all populations at risk of malaria with an appropriate vector control intervention by 2017
4. Enhance the surveillance system to detect, immediately notify, investigate, classify and respond to all cases and foci by 2017 to move toward malaria elimination
5. Implementing comprehensive IEC/BCC approach that facilitates at least 90% of people seeking treatment for fever within 24 hours at a health facility or with a qualified care provider and at least 85% of at-risk population utilizing an appropriate protection tool by 2017

1) Providing effective program management and coordination at all levels by 2017 to efficiently deliver a combination of targeted interventions for malaria elimination

Strengthen program management and coordination

2017: Mid-Term Review of Strategic Plan

2019: Malaria Program Review

Standard operating procedures (SOP) will be developed for all activities

Annual Malaria Review Meeting - align operational plans, submit to the MOH

CNM will carry-out bi-annual supervisory visits with field staff

Advocate for high level commitment to malaria elimination

CNM will issue official malaria progress reports to senior management of MOH as well as publish them online

Expand and maintain functional partnerships

Bi-annual meeting of National Multi-Sectoral Malaria Elimination Committee

Strengthen cross border collaboration for malaria elimination

Harmonize and synchronize interventions at border areas with neighboring countries

Coordination will be strengthened through data sharing agreements and formal action planning sessions

Mobilize resources to support program implementation

Engage with the private sector to ensure malaria elimination is a priority for investment and public-private collaboration

Introduce and scale up appropriate interventions for mobile, migrant and other underserved populations at risk of malaria infection

Mobility analysis will be carried out on a regular basis

Mapping and census of MMPs will be conducted every year at regular intervals to target interventions

CNM will collaborate with other sectors to target these populations:

- Ministry of Foreign Affairs
- Department of Immigration
- Department of Tourism
- Department of Forestry
- Provincial-level administrators

Military personnel will be targeted for engagement

Strengthen Procurement and Supply Management System (PSM)

CNM will establish a PSM working group to:

- Share regular updates regarding procurement and distribution

- Share stock levels of different commodities
- Coordinate with different partners and resolve any related matters

CNM will implement a mHealth-based stock management system

2) Achieve universal coverage of case management services by 2016 to ensure 100% parasitological diagnosis of all suspected cases and effective treatment of all confirmed cases

In an elimination setting, all suspected malaria cases must be diagnosed and confirmed with a parasitological diagnostic test

Drug failure is increasing along the Cambodia-Thailand border

Drug failure is defined by positivity up to 42 days after treatment

Strengthen the parasitological detection of malaria infections

All suspected malaria cases will be parasitologically confirmed before treatment and treatment will only be provided to positive cases

Diagnosis is done with microscopy and rapid diagnostic tests (RDTs), but microscopy is preferred

As an operational district transitions toward elimination, all malaria cases confirmed by RDT and/or microscopy will be re-confirmed by an expert WHO-accredited microscopist

Molecular diagnostics will be utilized as a surveillance tool for understanding the level of asymptomatic infections in low endemic areas with multidrug resistance to guide operations

Ensure prompt efficacious treatment of all confirmed uncomplicated and severe malaria cases according to national malaria treatment guidelines including the utilization of low dose primaquine to reduce the transmissibility of Pf and radical cure for Pv

Treatment will be stricly based on parasitological results and all malaria infections will be treated regardless of presence of signs and symptoms

All cases will be treated and tracked to ensure cure

In elimination targeted ODs, follow-up will be on day 7 and day 28 - if still positive or symptomatic, treated with second-line medications

DDF’s Pharmacovigilance Unit will monitor healthcare workers

Increase availability of quality case management services among private sector providers and industrial work sites and plantations

Private providers that do not qualify for the Public-Private Mix (PPM) program will not be allowed to sell antimalarials or diagnostics, nor will they be allowed to provide malaria diagnosis or treatment

Place at least one village malaria worker (VMW) in all villages in malaria risk areas

Number of villages with VMWs and MMWs will scale up from 2539 to 4528

Risk stratification will be used to prioritize villages in the highest incidence areas

CNM will collaborate with MOH to convert VMWs into multi-purpose healthcare workers wherever possible in short-to-medium term and absorb them into the national network of community healthcare workers in long term

CNM will map large-scale private sector work sites to identify areas vulnerable to importation from mobile and migrant populations

Strengthening the quality assurance and control systems for malaria diagnosis and antimalarial drugs

All laboratories will participate in Accredited External Competency Assessment (ECA)

Maintaining microscopy quality nationally will be essential to detecting treatment failure

Utilize mass drug administration (MDA) in targeted communities based on evidence and local context

CNM will consider the strategy of MDA in active foci with suspected reservoirs of large asymptomatic parasite carriers with an objective to interrupt malaria transmission in low transmission settings and to achieve rapid case reduction in moderate-to-high transmission settings

3) Protect at least 90% of all populations at risk of malaria with an appropriate vector intervention by 2017

Develop vector management strategy for malaria elimination

Take into account all potential intervention packages for reducing receptivity and human-vector interaction by geographical target area

Take into account cost-effectiveness and potential impact of each strategy

Distribution of long lasting insecticide-treated nets (LLINs) and hammock nets (LLIHNs) to all populations at risk

Long lasting insecticide-treated nets and hammock nets will be distributed to all populations at risk as the primary vector control strategy and areas will be prioritized based on risk strata

Indoor residual spraying (IRS) in all classified active foci to halt transmission

Indoor residual spraying will be implemented in active foci in response to the presence of local cases identified via passive or active case detection system

Strengthen operational research on potential interventions to reduce residual transmission

CNM will analyze the results of ongoing and completed operational research projects

Personal protection packs for forest goers (“forest packs”) are backpacks that can include an LLIN/LLIHN, hammock, repellent, rain coat, torch, and IEC materials - currently being distributed in two research pilots

Utilize environmental management strategies to reduce vector breeding sites

In active foci where entomological surveillance is carried out, CNM will assess the impact of potential environmental management interventions and develop policy guidance

Strengthen entomological surveillance for malaria elimination in active foci for malaria elimination

CNM will hire and train additional staff for the entomology unit to build capacity necessary for entomological surveillance for elimination

Entomological surveillance will include:

- Identification of vector species
- Monitoring vector behavior and bionomics
- Mapping species distribution and density
- Identification of host preference
- Seasonal fluctuation of species
- Assessment of an area’s receptivity

Routinely monitor insecticide resistance

CNM will work to harmonize current labs in Cambodia into one central lab for insecticide resistance monitoring and efficacy testing for vector control interventions

4) Enhance the surveillance system to detect, immediately notify, investigate, classify and respond to all cases and foci by 2017 to move toward malaria elimination

Detect and notify all malaria infections

Investigate each malaria case to determine whether it was locally acquired or imported from outside the country

Define system specifications for upgraded Malaria Information System (MIS)

CNM will collaborate with Department of Planning and Health Information (DPHI) to improve integration of Health Information System and MIS

Strengthen and build capacity to implement the surveillance system

CNM will also collaborate with Communicable Disease Control (CDC) Departments' Rapid Response Teams (RRT) at HC level to involve RRT staff in malaria surveillance activities

Strengthen passive case detection and routine reporting by all health care providers

Malaria will be a notifiable disease among all public and private sector providers and community healthcare workers across all endemic and non-endemic ODs

CNM will utilize "Day o surveillance" system as a foundation for real-time case reporting in all low endemic ODs targeted for elimination

Strengthen active case detection, case investigation and reporting for all malaria infections

All confirmed cases presenting at HC and hospital will be investigated following passive case detection, classified (local case, imported, introduced, and induced) taking into account patient household location and travel history, and reported via real-time case reporting system to MIS

Reactive case detection, screening carried out in response to a reported case, will be conducted around index cases using RDTs and/or microscopy

Regardless of results, all household members will be treated presumptively with first line antimalarials as per national drug policy

Proactive case detection, screening conducted based on suspicion of transmission or infections among high-risk groups, will be carried out dependent on previous year's malaria trends, seasonality of transmission specific to an area, or based on an influx of mobile or migrant populations from endemic areas

Strengthen investigation, classification, and appropriate response to all malaria transmission foci

CNM will investigate, classify, and map all foci (village-based) of malaria transmission using a geo-referenced system to help appropriately allocate interventions by area or household

CNM Epidemiology Unit will map and classify transmission foci as outlined in the foci investigation form - active foci (new, residual, potential)

Strengthen management and usage of data at all health levels

PHD/OD will have access to all relevant MIS data

Outbreak preparedness and response (OPR)

CNM will develop OPR early warning system that predicts, detects, and informs on the response to contain all potential outbreaks through immediate implementation of preventative and control measures

Annual restratification of all districts using surveillance data and mapping of outbreak-prone areas

Strengthening program monitoring and evaluation

A community survey based on methodology from previous Cambodia Malaria Surveys will be implemented in 2016 and serve as baseline for elimination

Other surveys, such as the Knowledge, Attitudes, Practices, and Beliefs Survey will be used on an ad hoc basis

Strengthen operational research for malaria

CNM will review and finalize the Policies and Guidelines to Conduct Malaria Research in Cambodia

CNM will require all partners to submit research data on a regular basis and information will be shared widely to inform changes in strategy

Routinely monitor the efficacy of first line antimalarial and test new drug regimens

CNM will carry out therapeutic efficacy studies (TES) on the country's first-line antimalarials

5) Implementing comprehensive IEC/BCC approach that facilitates at least 90% of people seeking treatment for fever within 24 hours at a health facility or with a qualified care provider and at least 85% of at-risk population utilizing an appropriate protection tool by 2017

Improve quality and dissemination of IEC/BCC messages for malaria elimination

CNM's Health Education Unit (HEU) will conduct monitoring and supervision of IEC/BCC activities in selected ODs every quarter

Strengthen community mobilization for increased uptake of malaria interventions

The Health Education Unit will work with other units at CNM and partners to conduct a mapping exercise to identify source communities of mobile and migrant populations and utilize community mobilization approach to deliver IEC/BCC messages effectively

Implementation of Strategic Plan

Stratification

Strata have been identified utilizing quantitative characteristics of malaria transmission

The primary value for categorizing the strata is malaria incidence, specifically incidence of P. falciparum and mixed infections in 2014 as reported by public health facilities

This is compared against a province level map indicating where there is evidence of multidrug resistance

Strata:

- Elimination-targeted ODs
- Transitional ODs
- Burden Reduction ODs
- Malaria Free ODs

Monitoring and Evaluation (M&E)

The M&E system promotes evidence-based decision-making

Monitoring and Evaluation Plan (2016-2020)

Coordination Mechanisms

All malaria research projects in Cambodia will be approved and overseen by the CNM Research Network (CNMRN)

CNM will organize bi-annual meetings of National Multi-sectoral Malaria Elimination Committee

Establishment of an Independent National Malaria Elimination Committee comprised of international malaria experts and Cambodian health specialists who are not involved in the national malaria response, but who can participate in a bi-annual review of program progress and are able to provide recommendations as necessary