

Intervention Area	Current Year (2011)	Planned (within next 5 years)
Case Management		
Diagnosis		
National diagnosis policy (confirmed, clinical)	The current national malaria diagnosis policy is based on clinical symptoms (where microscopy services are unavailable) and confirmatory microscopy diagnosis; microscopy services are available in all hospitals of high-endemic and medium transmission counties; in low transmission counties the services are available in County Hygiene Anti-Epidemic Stations (HAEIs); in 2010, out of 32,287 suspected cases 25,147 have been tested by microscopy (78%) (Please see "Program Integration" section below for definition of household doctors)	100% of suspected malaria cases will be confirmed by microscopy by 2013; the program will expand and improve existing HAEI diagnostic laboratories at provinces and counties and cluster-based laboratories at Ri, or village-level, hospitals/clinics to reduce the amount of cases treated on clinical diagnosis alone; the program aims to decrease confirmatory diagnostic waiting times to <24 hours
Tools (microscopy, RDT, PCR, parasite genotype, algorithm for clinical diagnosis)	Malaria microscopy is the sole method of confirming diagnosis; in areas where microscopy for suspected cases exam is not possible, malaria is diagnosed clinically	More microscopes and reagents for cluster-based laboratories will be purchased; program considers RDT introduction as a risk for preference by health workers over performing microscopy for diagnosis of malaria; PCR-genotyping will be established in future
Monitoring/QA	10% of all positive and 10% of all negative blood slides taken at Ri (village) level are being cross-checked by higher level laboratory each month; county-level lab is being monitored by province and province by central level for QA every 3 months; correctness of cross checked slides is approximately 78%	Laboratory quality control will be further strengthened according to international standards; strengthening microscopy trainings & post training on job monitoring is part of the plan
Treatment		
<i>P. vivax</i> – 1 st line treatment protocol (radical cure, type, unit, dose); contraindicated populations (type, unit dose)	Suspected cases are treated only with chloroquine; radical cure treatment is giving to both of confirmatory and clinical cases with additional symptom of malaria. Dose: Chloroquine (25mg/Kg over 3 days) and primaquine (PQ) (0.25mg/Kg/day for 14 days); primaquine is contraindicated in cases showing side effect of drug in previous occasion, pregnant women and child under 5; as G6DP deficiency test is unavailable prior to PQ treatment, side effects are monitored through symptoms and signs; once patient complains of suggestive haemolytic symptoms,	Treatment of only confirmed and strongly suspected clinical cases; radical treatment will be limited to only confirmed cases; all confirmed cases will be followed up monthly to ensure cure; program will progress to identify and treat relapse cases.

	primaquine is stopped.	
<i>P. vivax</i> – 2 nd line treatment protocol	N/A	
<i>P. falciparum</i> – National treatment protocol/policy (type, unit dose)	No Pf cases in DPRK	No Pf cases in DPRK
<i>P. falciparum</i> – Complicated Malaria	No Pf cases in DPRK	No Pf cases in DPRK
Mixed infections – National treatment protocol/policy (type, unit dose)	No Pf cases in DPRK	No Pf cases in DPRK
Directly Observed Therapy (DOT) and Case Follow-up (drug adherence)	DOTS is practiced but uniformity of the approach has not been achieved.	Will further strengthen DOTS so that household doctors can monitor full compliance with 14-day PQ regimen
G6PD screening	N/A	
G6PD prevalence survey	N/A	
Mass screening & treatment/Focal screening	N/A	Case-based surveillance, case investigation, community screening and treatment is part of the updated national strategy; however, due to lack of resources the activity is not being implemented; when additional resources are secured, these activities are a high priority.
Focused Mass Drug Administration (MDA)		
Monitoring/QA	N/A	This will be conducted; TES is planned for 2011 in two sentinel sites.
Chemoprophylaxis		
Prophylaxis - travellers	N/A	
Prophylaxis – high risk populations	968,818 people living in high transmission Ri (villages) were administered mass chemoprophylaxis with primaquine; mass prophylaxis with primaquine (standard regimen: 0.25 mg/kg/day) for 14 days	Mass prophylaxis with primaquine has contributed to rapid reduction of malaria burden; the program will reevaluate the effectiveness of the intervention in low transmission setting and make decisions on highly focal mass chemoprophylaxis
Prophylaxis – pregnant women	N/A	N/A
Intermittent Preventive Treatment – infants (IPTi), Children (IPTc) or in Pregnancy (IPTp)	N/A	N/A
Prevention		
Vector Control		
IRS Strategy (e.g., spatial or temporal rotation)	IRS targets all Ris (villages) with malaria transmission in medium malaria-endemic counties; in 2010, only 76.4% of	Scale-up of focal IRS to households and animal shelters within high and moderate transmission Ris (villages) and in Ris with

	targeted households (including animal shelters) were covered with IRS due to limited availability of insecticides; rotational use is under discussion	focal outbreak; by 2013, up to 95% of households and animal shelters within high and moderate transmission Ris are planned to be covered with IRS; attainments of the results are related to availability of adequate resource for procurement of insecticides
Insecticides	Deltamethrine was used for IRS by 10g/m ² with approximately 120m ² of coverage at household level	To be chosen based on insecticide susceptibility test results
LLIN	Delivery of two free LLINs/household to 911,045 households in high transmission areas (>2 cases/1000) is the strategy; however, due to shortage of LLIN only 300,000 LLINs were distributed (almost one LLIN/HH) in 2010	An additional 79,960 LLINs have been distributed in 2011 and 332,000 will be distributed in 2012; the total LLIN requirement is at least 1.05 million; resources for 500,000 additional LLINs are required to meet the target of 95% of households coverage by 2013
Expired LLIN collection & replacement	Replenishment of LLINs not yet needed as nets last at least five years in the temperate climate	To be implemented according to result of investigation on effectiveness of LLIN
ITN (and insecticides used)	Distribution of ITNs in the past was sporadic; no plan to offer re-treatment of old nets due to focus on LLIN distribution	
Larval control & environmental modification	Agricultural irrigation techniques have contributed to the formation of semi-permanent and permanent breeding sites; larval control by water management and with larvivorous fishes was conducted as pilot study in 2010	Water management method will continue; research on effectiveness of BTi and larvivorous fish will define more widespread application of the vector control tool
QA	Insecticide susceptibility test was conducted in 3 sentinel sites	Planning to conduct various types of studies on effectiveness and QA of vector control methods
Other	Primary vector is <i>An. sinensis</i> , other important vectors are <i>An. listeri</i> , and <i>An yatsushiroensis</i>	Will implement personal protection measures through impregnation of work clothing with insecticide for agriculture workers or those who work outdoors during evening hours in high transmission zones
Advocacy & Education		
Mass media	Mass media was not widely used for anti-malaria campaigns	Planning to involve mass media widely in malaria season
IEC/BCC campaigns	BCC guideline was developed in 2010; various IEC materials (poster, leaflet and training material) were developed and distributed to health facilities and community levels; in total, 6,800 of household doctors/volunteers were trained on IEC/BCC and 18144 health facilities/community centres received IEC materials	DPRK is working to develop a Communications for Behavioral Impact (COMBI) strategy to increase knowledge of malaria transmission, ensure correct LLIN use, improve health-seeking behaviour, promote understanding and compliance of radical treatment, and promote community and household-based malaria control efforts; key IEC messages will be delivered through mass media, household doctors and community health volunteers; plan to implement Inter-sectoral delivery of IEC information through primary schools and agricultural

		sector; will involve national associations (named in “community-based interventions,” below) to disseminate IEC/BCC messages; will use audio-visual and folk media to increase malaria awareness and facilitate group discussions
Community-based interventions	Household doctors and volunteers are actively involved in anti-malaria campaign including case detection, treatment, Integrated Vector Management and BCC; local and international NGOs/Associations (IFRC, National Red Cross Movement, Korean Women’s Association, Korean Agricultural Worker’s Union, etc) are also contributing to implementation of these interventions	With possible help from other sectors and NGOs, will increase community empowerment and awareness-raising through IEC campaigns; IEC will focus on malaria symptoms and indirect socio-economic impacts, LLIN distribution, and IRS programs
Surveillance		
Case detection and reporting		
Case reporting system	Hospitals/clinics report record the data on the national malaria surveillance format and report to county by phone every 10 days; provinces report to the centre every month; computers are only available at the central and provincial levels without intranet connection between them; malaria surveillance is integrated in to the Integrated Disease Surveillance System	Strengthening the National Health Information System with further integration of all components of the malaria program and additional program; feasibility assessment of developing a electronic data management system is planned.
Active case detection (ACD)	None	Case based surveillance, case investigation and community screening will be conducted; the magnitude of the scale-up of the intervention is dependent on the availability of additional resources
Passive case detection (PCD)	As explained above in case reporting	As explained above in case reporting
Case investigation or “re-active surveillance”	None	As explained above in active case detection
Other surveillance (e.g., screening, prevalence surveys)	None	As explained above in active case detection
Outbreak (Epidemic) detection and response		
Outbreak/Epidemic Prediction & Response	Each province updates their Outbreak/Epidemic Preparedness Plan every year and gives training and guidance to county and Ri (village) staff to develop their own preparedness protocol	A Ri-based (village-based) malaria control plan is being developed and a Rapid Response Team, created to respond to all communicable disease outbreaks, will be established in central, provincial and county levels and will also be strengthened; the team will conduct central, provincial and county-based situation analysis on formulation and sub sequential yearly updating of epidemic preparedness and

		outbreak response protocols with initial attention aimed at high-transmission areas; the teams will investigate and respond to the outbreaks
<u>Entomological surveillance</u>		
Surveillance vector species, behaviour, or densities	<p>In most parts of the country, the vector density begins to increase in June and maximum density is observed in July and August; <i>An. sinensis</i> and <i>An. yatsushiroensis</i> bite from dusk to dawn and their peak biting hours is from 9 PM -1 AM; during biting time they prefer to obtain a full meal; they are predominantly zoophilic and only bite humans when their preferred animal hosts are unavailable; the majority of their human baits occur indoors</p> <p>After anthropagic/endophilic baits occur, they rest for a while indoors and disappear to their resting site before dawn which consists of mainly huts and shades; their flight ranges is about 2 kilometers and generally live in a village during their life time; average span of sporogony is between 8-10 days; <i>A. yatsushiroensis</i> is predominantly endophagic and anthropophagic and their peak biting hours is around midnight</p>	Gap analysis of the entomological surveillance system is being conducted; based on the conclusion of the gap analysis, modern methods of surveillance will strengthen the current national methods; the adoption of new methodologies for surveillance is dependent on availability of additional resources
<u>Resistance monitoring</u>		
Insecticide and drug resistance activities	In 2010 an insecticide susceptibility study was conducted in 3 sentinel sites; vectors were sensitive to all insecticides tested including deltamethrine; no drug resistance studies were conducted.	Vector sensitivity to insecticides will be monitored every year. Therapeutic Efficacy Studies of anti-malarials will be undertaken every two years; drug resistance monitoring sentinel sites will be established, starting with two in 2012; additional sites will be added to get better picture of drug susceptibility to parasites
Drug efficacy	Therapeutic efficacy studies of anti-malaria drugs have not been conducted since 2005; up to date chloroquine and primaquine are being reported as effective	Same as above
<u>Prevention of reintroduction</u>		
High risk populations	Total population living in malaria transmission counties have been classified as high risk and interventions have targeted the population; half of the malarial infections have been confirmed amongst agriculture and night-time workers; the program considers this group of cohorts as high risk	People living in malaria transmission Ri (village, not county) will be classified as high risk population and interventions will be targeted in these areas; agriculture and night-time workers in malaria transmission areas will be protected by Insecticide Treated Clothes in malaria transmission season

	population	
Border screening	N/A	N/A
Cross border collaborations	Cross border collaboration is part of the malaria program, but no significant activities or specific interventions were conducted in 2010	Cross-border forums for information exchange on malaria control interventions between DPRK and bordering countries
Vector-control specific POR activities	N/A	N/A
Program Management and health systems		
<u>Program Finance</u>		
National elimination goal (by province, district)	As of 2010, the national goal is to reduce overall malaria incidence by 50% of the level in 2007 (incidence 0.62 per 1000) and reduce malaria in high transmission zones by 70% of the level in 2007 (incidence 2.4 per 1000) by 2013	Reduce overall malaria incidence by 50% of the level in 2009 (incidence 1.57 per 1000) and reduce malaria in high transmission zones by 70% of the level in 2009 (incidence 3.1 per 1000) by 2014; reduce number of Ris (villages) with malaria transmission (target will be provided when the new strategy will be developed)
Funding sources and funding budget from each source	6% of national budget is allocated to national healthcare with \$1.8M USD/year allocated to malaria programme; GFATM Round 8 grant has been awarded to the country; the total grant amount is Euro 18.3M	Sustain and increase government malaria financing; the GFATM Round 8 grant covers up to February 2015; the program will apply in future GFATM Rounds and also seek funding from other donors to meet the gaps of the pre-elimination strategy
<u>Stratification</u>		
Stratification strategies for defining risk areas, to allocate resources & activities (tools may include sampling strategy, population-based statistics, GIS)	High transmission areas: 29 cities/counties (malaria incidence >2/1000); Moderate transmission areas: 62 cities/counties (malaria incidence 0.8 - 2/1000); Low transmission areas: 32 counties (malaria incidence <0.8/1000); Malaria free areas: no indigenous case	Ri level (village-level) malaria data is being collected; based on the analysis of the data Ris will be classified into different transmission strata
<u>Program structure and organization management</u>		
Program management	National Malaria Control Programme in the MoPH is responsible for policy, planning, budgeting, advocacy, and international cooperation; Central Hygiene and Anti-Epidemic Station department provides technical support and reports on case surveillance and treatment outcomes, and provides programme management, logistics, training and supervision to provinces and counties/districts; a Program Management Unit (PMU)	Further strengthen program management and capacity through strengthening logistical management and infrastructure of MoPH malaria control programme; Human Resources for Health (HRH) plan is being developed by MoPH with WHO assistance

	has been established with the support of the GFATM Malaria grant, which coordinates with national program managers for smooth implementation, monitoring, and reporting and for better coordination of all control activities	
Procurement & supply management	Under the National Malaria Control Programme there is a PSM unit which manages all commodities and health equipment related to Malaria Programme implementation; the PSM unit works in close coordination with UNICEF for PSM related to the Global fund activities; the logistic are distributed through the delivery networks of the central, provincial and county medical warehouse	Timely procurement and distribution of high impact tools and interventions will be ensured; training of the health workers in PSM is planned for 2012-2013
Financial management	Financial management of external funding, especially the Global Fund grant has been a new experience for the program; however, the program has been able to achieve good grant performance result.	Capacity building on program and financial management, and English language training will be ongoing; technical and financial records and reports of all transactions will continue to be maintained for review by relevant organizations or agencies
Program integration		
Level of integration of malaria elimination into public health	The malaria program is integrating into the communicable disease program; the malaria program scale-up is targeting health systems and Primary Health Care Strengthening; integration of malaria surveillance as part of the Integrated Disease Surveillance System is ongoing	The program plans to train laboratory technicians of other sectors in different level hospitals on malaria microscopy; working to strengthen inter-departmental collaboration of health facilities and other ministries on BCC campaigns
Personnel		
Reorientation, retraining, or restaffing & capacity development	Capacity building in microscopy, epidemiology, entomology, research capacity, data and logistic management was conducted	Will recruit microscopists and entomologists and conduct refresher training for public health personnel at county and provincial level; to provide international/regional exposure and technical training for national malaria control programme personnel through external technical assistance; planning to update medical curricula, pre- and in-service training of nurses to include principles and implementation strategies of National Malaria Control Programme; will also strengthen capacity of community-based health personnel to ensure follow-up
Legal Framework		
Frameworks/policies/regulation/strategic plans	National Malaria Control Strategy 2009-2013 National Malaria M&E Plan (2010-2013)	Need for increased coordination of stakeholders in formulation of policy directives, strategies, and service delivery mechanisms

Standard Operating Procedures (SOP) – list subject	Malaria microscopy National Malaria Treatment Guideline Guideline on IRS	Will update National Guidelines for: case management, province, county and Ri-based (village-based) epidemic preparedness and outbreak response protocols, vector control, standardized distribution of nets, vector biology, operators manual for IRS, malaria control by larvivorous fish, Communications for Behavioral Impact (COMBI) strategy; management and correct use of microscopes and parasite identification, QA.
Private sector – Providers		
Engagement with formal providers (case management, reporting, other)	N/A	
Engagement with informal providers (case management, reporting, other)	N/A	
Training	N/A	
Other	N/A	
Monitoring and QA	N/A	
Private sector – Companies/Businesses		
Employee or community programs (e.g., medical services, bed net campaigns)	N/A	
Partners		
Funding	RBM ROK WHO GFATM UNICEF	GFATM WHO UNICEF
Implementation (list partners and type of collaboration)	RBM (WHO/IFRC) has provided assistance after re-emergence of malaria in 1990s with mass chemoprophylaxis, and provision of LLINs; WHO country office provides technical and logistical assistance; GFATM awarded R8 malaria grant with UNICEF as PR and	GFATM: Major partner of the malaria and TB program WHO: Technical partner and SR for the GFATM R 8 grant UNICEF: PR for the GFATM R 8 grant. APMEN: Technical assistance

	<p>WHO as SR; Community-based partnership with people's committees, Korean Elderly Association, Trade unions, and the Women's association along with International Federation of the Red Cross; Partnership with agriculture sector for water management</p>	
M&E		
M&E Elimination Plan, indicator development	<p>National M&E plan was developed in 2010 and is being implemented; impact and outcome indicators were made to measure goals and objectives and under each objective through activity specific indicators programme progress status are being assessed</p>	<p>Laboratory quality control will be further strengthened through re-reading, proficiency testing, and on-site supervision; Data quality improvement is planned by data validation through cross-checking of malaria register at counties and provinces and incorporating the feedback of the audit; Supervisory visits, patient and staff interviews, and external monitoring missions by WHO and other invited international agencies will provided further inputs to improved program management; Program analysis through quarterly peer meetings at central, provincial, and county levels and dissemination of the outputs through quarterly and annual reports will be complimented by internal and external evaluations of outcome/impact targets at the end of year</p>
QA/QC (diagnosis, supply chain, etc)	<p>Quality control of blood smears according to WHO guidelines currently being met and accuracy of microscopy test has reached more than 78% in 2010</p>	<p>Will strengthen QC to ensure more than 90% of correctness of microscopy test</p>
Other		

<i>Operational Research</i>	<i>Research in past 5-10 years</i>	<i>Present research projects</i>	<i>Planned research projects</i>
Parasitological research projects, in particular for <i>P. vivax</i> ; list major outcomes and please cite publications when relevant	2005: Therapeutic efficacy study shows chloroquine is sensitive against <i>P. vivax</i>		Therapeutic efficacy study
Entomological research projects; list major outcomes and please cite publications when relevant	2010 entomological surveillance findings: See Entomological Surveillance Section (above).	Insecticide susceptibility against malaria vectors	Effectiveness of BTi for larval control; effectiveness of Insecticide Treated Clothes for prevention of malaria amongst high risk groups; protective duration of current LLINs; insecticide susceptibility against malaria vectors; effectiveness of locally available fish in larviciding
Behavioural research projects; list major outcomes and please cite publications when relevant		KAP survey	Impact of BCC; Knowledge, Attitude, and Practice (KAP) surveys
Other research projects; list major outcomes and please cite publications when relevant		Mapping and classification of Ris (villages) with malaria transmission	G6PD deficiency in general population
Research Partners (national, regional and international) in operational research projects	National research Institute, WHO	National research Institute, WHO, UNICEF	National research Institute, WHO APMEN

Quantitative Data			
Variable	Data	Source	Notes (include year if not 2010)
Total population	23,349,859	NMCP	2010
Population at risk (PAR): Low, Medium, High	14,992,131	NMCP	2010
Total malaria deaths, Total estimated deaths	0	NMCP	2010
Total malaria cases	15,392	NMCP	2010
Total positive slides – <i>P. vivax</i>	13,520	NMCP	2010
Total positive slides – <i>P. falciparum</i>	0	NMCP	2010
Total suspected cases	32,287	NMCP	2010
G6PD deficiency % population	N/A		
# imported malaria cases (national)	127	NMCP	2010
Slide positivity rate (SPR)	5%	NMCP	2010
Annual blood examination rate (ABER)	0.29	World Malaria Report	2010
Annual parasite index (API)	0.9	NMCP	2010
Parasite prevalence rate			

Main Sources:
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