

Eritrean experience in Scaling-up Malaria Prevention and Control



National Malaria Control Program
Ministry of Health
State of Eritrea



Acronyms

ANC	Ante natal care
ARI	Acute respiratory infection
CHAs	Community health agents
GDP	Gross domestic product
HAMSET	HIV/AIDS, Malaria, Sexually transmitted diseases and Tuberculosis Project
HF	Health facility
HIV/AIDS	Human immuno deficiency virus/Aquired immuno-deficiency disease syndrome
IDP	Internally displaced populations
ITNs	Insecticide treated nets
IRS	Indoor residual spraying
LLINs	Long lasting insecticidal nets
M&E	Monitoring and Evaluation
MOH	Ministry of Health
OPD	Outpatient department
RBM	Roll Back Malaria
TB	Tuberculosis
WHO	World Health Organization

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1. Introduction

Eritrea is a semi-arid tropical country, which is situated in the Horn of Africa. It is bordered by Sudan to the north and west, Djibouti to the southeast, Ethiopia to the south and the Red Sea to the east. Its land covers an area of 124,320 Km² with an estimated population of 3.6 million and with GDP of 200 USD per year.

Malaria is endemic, highly seasonal, focal and unstable in Eritrea. The commonest malaria parasite in Eritrea is *Plasmodium falciparum*, which accounts for more than 84% of all cases. *Plasmodium vivax* represents 16% of the malaria positive smears. The main vector involved in transmission of malaria is *Anopheles arabiensis*. There are two main transmission seasons from September to November in the central, southern and western lowlands and from January to March in the coastal plains. Two thirds of the population (2.4 million) resides in malaria endemic areas. The most vulnerable groups for malaria transmission are children under 5 years, pregnant women and non-immune individuals who migrate from the highlands to the endemic areas.

The goal of the malaria control program in Eritrea is to reduce morbidity and mortality due to malaria to such low levels that malaria will no longer be a public health problem.

To achieve this goal , Eritrea adopted a package of the RBM strategy in 1999 in which the following comprehensive and integrated interventions are deployed:

- Case management
- Integrated vector management
- Epidemic prevention
- Capacity building
- Operational research
- Health promotion
- Supervision monitoring & evaluation
- Promotion of partnership

As a result of implementing this comprehensive package of interventions in an integrated programme and covering a wide geographical area, Eritrea has scaled up malaria control interventions for impact. This report summarises the main activities and results by intervention, as well as the challenges faced and lessons learned.

2. Implementation of the Practice

2.1. Integrated vector management (IVM)

Integrated Vector management includes distribution of ITNs, Re-treatment of conventional nets, Indoor Residual Spraying (IRS), source reduction or elimination of breeding sites and larviciding. T as well as free ITNs to

Indoor Residual Spraying (IRS) has been carried out in specific highly endemic villages in two Zones (regions) out of the six Zones. Since 1999, the Zonal staff of Malaria control units in collaboration with community health agents and public health technicians have been conducting IRS using DDT and Malathion in 2001 to 2004 and only DDT since 2005...As a result 529,916 households were sprayed and 1,536, 154 people protected since 2001 as shown in table 1.

Table 1: IRS Operation

Year	No. of households targeted	No. of households	IRS Operational Coverage %	No. of people protected	Insecticide used
2001	79,776	76,754	96	202,652	DDT + MALATHION
2002	63,235	60,453	96	159,551	DDT + MALATHION
2003	54,008	51,038	95	139,913	DDT + MALATHION
2004	97,534	92,107	94	259,420	DDT + MALATHION
2005	94,823	89,134	94	260,263	DDT
2006	73,168	68,778	94	208,377	DDT
2007	97,502	91,652	94	305,978	DDT

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Source: Eritrea NMCP

The Eritrea government policy is tax exemption for all malaria control commodities. In addition ITNs/LLINs are distributed free to children under five, pregnant women and internally displaced people through health facilities, community health agents and the social marketing group. From 2001 to 2004, only conventional nets that require retreatment were distributed in Eritrea. Since 2005, only LLINs are distributed as shown in table 2. In 2007, over 90% of the ITNs were re-treated at no cost to the beneficiaries. The conventional nets are replaced by LLINs, net retreatment campaigns will cease in Eritrea.

Table 2 : ITNs distributed in Eritrea since 2001.

Year	Total No. of conventional insecticide-treated nets (ITNs) delivered	Total No. of long-lasting insecticide-treated nets (LLINs) delivered	Total No. of ITNs (both conventional and LLIN) delivered	No. of ITNs delivered to pregnant women	No. retreated
2001	141,766	0	141,766	NA	135,290
2002	276,038	0	276,038	15,016	227,750
2003	187,815	0	187,815	10,884	497,117
2004	215,000	0	215,000	52,947	544,464
2005	0	107,657	107,657	25,180	797,355
2006	0	80,673	80,673	29,449	656,994
2007	0	159,360	159,360	43,643	621,389
	820,619	347690	1,168,309	177,119	3,480,359

Source: Eritrea NMCP



ITNs are distributed to children <5, pregnant women and IDPs free of charge.



Free distribution of ITNs to pregnant women during an ANC visit

2.2 Case management

Based on results of antimalarial drug efficacy studies, Eritrea changed the first line treatment of uncomplicated malaria from Chloroquine (CQ) to CQ + SP in 2001. All formal health workers and more than 2,400 community health agents have been trained on the new drug policy. As a result, the CHAs are managing about 80% of all uncomplicated suspected cases of malaria at community level and referring complicated cases to the nearest health facility. For example, in 2007 66,350 malaria cases were treated by CHAs compared to 10,801 confirmed malaria cases treated at health facility level.

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Due to rising resistance to CQ + SP the antimalarial drug policy was changed to AQ + AS as first line treatment in 2007. To implement the latest policy change, Eritrea has trained formal health workers in the new treatment policy. However, ACTs are only available at the health facility level while the CHAs are still using CQ+ SP and referring complicated cases to health facilities. Eritrea purchased 25,000 ACT doses in 2007 and 287,000 doses in 2008 and there are no reported ACT stock-outs at health facility level.

The equitable distribution of health facilities throughout the country coupled with constant availability of diagnostic equipment, drugs and supplies combined with well-trained health workers ensured the successful management of complicated malaria cases. To further strengthen malaria case management; there will be need to introduce ACTs at community level.

Community Health Agents (CHA)
The backbone of malaria control in Eritrea



Pre-malaria transmission season refresher course

CHA reports to health facility

CHA taking first line anti-malaria drugs from health facility

2.1.3

2.1.5 Epidemic prevention

Since 1999 a total of 26 sentinel sites through out the country were established for forecasting and early detection and response to malaria epidemics. These sentinel sites which are health facilities, collect data on malaria cases and deaths. The meteorological data (temperature, moisture and rainfall) is collected by the public health technicians who together with the malaria focal points graph all the data and compare. Meteorological data is for epidemic forecasting an prevention while weekly health facility data is used for prevention, early detection and control by comparing the data to pre-determined epidemic thresholds. In addition, every HF in the country monitors the malaria situation weekly and monthly using wall charts and graphs with thresholds tailored to each locality. As a result, there have been no epidemics since 1999.

2.3 Capacity building

In order to alleviate the shortage of human resources, the MOH trained CHAs in malaria case management, referral and integrated vector management using specially designed training manuals and modules. The CHAs bring services closer to the population, *reduce* delays & complications, strengthen the linkage with health facilities and ensure community empowerment, ownership and sustainability of the program. CHAs are given refresher training prior to the malaria transmission season. In addition health workers are also regularly trained

on the management of complicated malaria. The number of CHAs involved in malaria case management has increased from 500 in 2000 to 2400 in 2007.

To strengthen referral health facilities, regular training and refresher courses of health workers, laboratory technicians and Zonal malaria technicians was conducted regularly by the MOH.

2.4 Operational research

The importance of operational research for the malaria control program is to assist MOH to take major evidence based policy decisions. In order to accomplish this, the MOH put in place a mechanism for regular analysis of non-response suspected malaria cases that were referred by CHAs and confirmed as malaria at facility level throughout the country since 1999. In addition, there was a follow up mechanism to analyze weekly reports and trends of malaria cases at sentinel sites as well as in all HFs in the country. Furthermore, regular yearly drug and insecticide efficacy studies were carried out with the support of WHO for the last seven years.



Researches for evidence based decision making - one of the strategies

2.5 Health promotion

The national malaria control program of the MoH in Eritrea adopted a strategy of community empowerment, ownership and wider use of CHAs to promote positive behaviour change. Various channels of communication including mass media,

interpersonal communication, use of promotional materials and utilization of drama groups, malaria related films and folktales were used to improve the awareness of the community. In addition, the social marketing group in the country enhanced health promotion activities at grass root level, provided services at no cost and distributed ITNs with priority to vulnerable groups. The other important activity that contributed towards positive behaviour change was the implementation of annual national malaria campaign week before the onset of malaria transmission season (July) since 1999 with the full participation of all sectors, other stakeholders and the community at large.



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Annual malaria review and planning meeting

respect, the Malaria & Public Health Technicians provided regular supervision of CHAs using standardized supervisory checklist. In addition, the functionality of the sentinel sites is regularly monitored by Zonal and central malaria units. Furthermore, regular quarterly review meetings were held to monitor morbidity and mortality trends and status of implementation of planned activities including the recommendations of previous reports by Zonal and central malaria focal persons. With regards to evaluation, the MOH and partners conducted national

annual review meetings since 1999, promoted midterm and final evaluation of the strategic plans and facilitated the dissemination of all reports.

2.7 Promotion of partnerships

There is an effective coordination mechanisms between MOH and partners aimed at minimizing duplication of efforts and wastage of resources. This is achieved through joint planning, implementation and evaluation during annual review meetings at national level. Malaria is one of the diseases included in the World Bank supported project called HAMSET (HIV/AIDS, Malaria, Sexually Transmitted Disease and TB). The coordination mechanisms at Zonal/district and sub district levels for the HAMSET Project are applied to the malaria programme. Furthermore, there is an ongoing internal and external resource mobilization, promotion of good financial accountability through adherence to specified financial regulations and effective utilization of available human and material resources.



Partners participating in the Annual Review and Planning Meeting

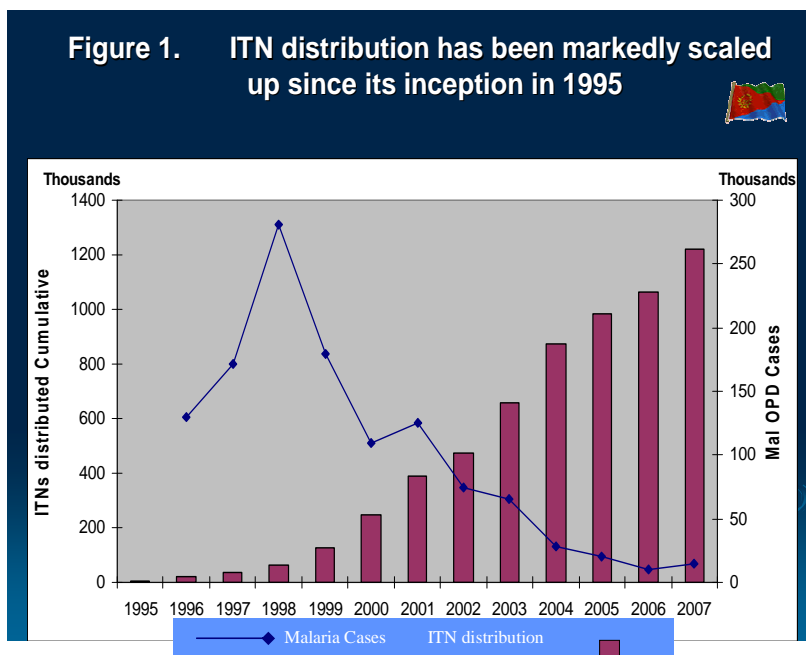
3 Outcomes and Impact

The achievements with respect to the attainment of the Abuja 2005 coverage targets and RBM 2010 goals on morbidity and mortality reduction indicate that

Eritrea has succeeded not only in achieving the expected outcomes but has gone beyond.

In 1999, malaria was the leading cause of morbidity in Eritrea accounting for 31.5% of OPD patients and 28.4% admissions. The case fatality rate for all age groups in 1999 was around 2.4%.

By 2007 malaria cases and deaths at health facility level had been reduced by more than 90% while case fatality rates have been reduced by more than 85% compared to 1999 levels. There is a strong correlation between the distribution of ITNs and reduction of malaria related morbidity. In the year 2000, around 200,000 ITNs were distributed. By then the malaria morbidity was around 100,000. Up to 2007, more than 1.2 million ITNs were distributed and morbidity dropped to around 20,000. (Figure 1)



In 2000, malaria ranked third as a cause of mortality among children less than five; by 2007, it was the ninth. Among those aged above 5 years of age, malaria

was the leading cause of in-patient deaths in 2000 but by 2007, it was no longer among the top ten.

4. Lessons learnt and Challenges

The major lessons learned are:

- High political commitment, promotion of community ownership and empowerment play a significant role in malaria control.
- The implementation of an integrated and comprehensive package of interventions (free distribution of ITNs, community based case management by CHAs, integrated community based vector management) has led to increased coverage of interventions and impact on the burden of disease.
- Proper and accountable management of available financial and material resources enhances program effectiveness and donor confidence.
- A good surveillance and monitoring system producing robust data is useful for policy development, tracking progress, planning and appropriate targeting of interventions.

The main challenges are:

- Cross-border transmission of malaria and sustaining of the gains made;
- Ensuring the availability and adequate use of ACTs by community health agents;
- Maintaining a high level of coverage of preventive interventions at a time when the number of malaria cases is decreasing;
- Continued mobilization of resources for malaria when it is no longer part of the top ten causes of morbidity and mortality

5. Conclusion

Eritrea has demonstrated that malaria can be controlled in a resource limited environment through active implementation of a comprehensive and integrated package of interventions, strong leadership and at all levels, involvement of CHAs in malaria control as well as proper management of available resources.

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Annexes

Table 1. Comparison of CHA treated malaria/febrile cases, 2006-2007

ZONE	CHA 2006	CHA 2007	HF 2007
Anseba	6,117	6,849	768
Debub	14,039	16,965	1711
Gash-Barka	46,199	33,744	7048
Maekel	719	513	698
NRS	4,646	8,279	
SRS	55	0	
TOTAL	71,775	66,350	

Confirmed Malaria in 2007.

ZONECODE	ZONENAME	YEAR	Falciparum Malaria	Vivax Malaria	Total Confirmed malaria
AN	ANSEBA	2007	613	155	768
DE	DEBUB	2007	1,532	179	1,711
DK	DEBUBAWI KEYHI BAHRI	2007	20	14	34
GB	GASH- BARKA	2007	6,480	568	7,048
MA	MAAKEL	2007	510	188	698
NR	NATIONAL REFERRAL	2007	78	18	96
SK	SEMENAWI KEYHI BAHRI	2007	266	180	446
TOTAL			9,499	1,302	10,801

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Total	560,046	529,916	95	1,536,154	