Revolutionary Government of Zanzibar

Ministry of Health

Zanzibar Malaria Performance Review Report

Draft 05/10/2011

September 2011

Foreword

Ministers picture

Hon Juma Duni Haji
Minister for Health
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There is remarkable progress in shrinking the malaria map globally. Malaria endemic countries in Sub Saharan African put a lot of efforts in realising RBM targets aiming at sustaining the achievements gained over the last few years eventually eliminating the disease.

The renewed efforts to control malaria in Sub Saharan African countries are considered as the latest invention of effective means for elimination. Increasing use of long-lasting insecticidal nets (LLINs), indoor residual spraying (IRS), malaria rapid diagnostic test (mRDT) and artemisinin-based combination therapies (ACTs) provides an unprecedented opportunity to control and, where possible, eliminate this deadly disease. Zanzibar is among the few parts of the global accelerating her efforts in eliminating the disease. In so doing the need of conducting comprehensive Malaria Programme Review (MPR) was realised in order to re-shape the way forward.

This is the first main review conducted in Zanzibar, Tanzania. The review of Malaria Control Programme was carried out by a team of national and international reviewers during August – September, 2011 with very clear focus.

The Malaria Programme Performance review is a periodic joint programme management process for reviewing the progress and performance of a malaria programme within the context of the national health and development plans. The review aims at improving the performance and/or re-defining the programme's strategic direction and focus.

MPR made thorough assessment to the current strategies and activities in order to strengthen the malaria control programme and systems used in delivery of key interventions. This Review has portrayed the identification of strengths and challenges for the programme on which key action points proposed will help to strengthen key interventions

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Overall, the ZMCP has made significant progress in controlling malaria with financial support from the Revolutionary Government of Zanzibar and diversity of development partners. The programme successfully revised national treatment guidelines and implemented new treatment policy with new tools such as rapid diagnostic tests, arteminisin-based combination therapy (ACT) and long-lasting insecticidal nets (LLINs). Despite all these, there are several challenging and issues mentioned in this main review (in all thematic areas) that needs join efforts if elimination agenda has to be realised.

The review team made observations, specific recommendations covering technical areas as well as general recommendations. Issue of surveillance, research, epidemic preparedness, malaria stratification, entomological studies, and other key interventions are among the areas that need special attention. The report placed a strong emphasis on sustaining the current gains through the strengthening of supportive systems and strategies including quality of care at the peripheral and peripheral facilities linked with communities.

While it is reasonable to state that malaria has been successfully controlled in Zanzibar, this success remains fragile and much work remains to ensure that achievements are sustained over time. The historical trends show that malaria vulnerability is high and therefore the possibility of malaria resurge in the islands is obvious if the malaria control interventions are not maintained and sustained over time. It should be noted that Malaria elimination cannot be business as usual, but needs a systemic and new programmatic approach supported by political and financial commitment.

On behalf of the Ministry of Health I urge all stakeholders in health including our development partners and the general population to do everything possible that will ensure the review findings translated into implementable strategic interventions that will have an effect to malaria is elimination in Zanzibar.

Looking forward Malaria free Zanzibar

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Acknowledgements

Zanzibar, like any other malaria endemic country has embarked in the process of eliminating this deadly disease. It is well known that elimination of malaria would be feasible if the technical, operational, and financial challenges to the permanent interruption of transmission could be overcome.

Present elimination strategies are based on recommendations derived from a number of stakeholders started since the Global Malaria Eradication Program of the 1960s. This authoritative Reviews prepared has provides expert opinion on the feasibility and recommendations of malaria elimination in the country.

The Ministry of Health Zanzibar appreciates the production of this report and therefore would like to acknowledge the efforts made by different contributors. First and foremost, The Malaria Technical Working Teams that was involved during the whole process; from the preparation of this review to final production of this useful report.

The MPR report 2011 was made possible with advice and contribution of all ZMCP Officers from Unguja and Pemba. Special thanks to the focal persons and their team members not only for their dedication but also for providing relevant information and data to enrich this report. The Ministry would like to acknowledge support provided by the District Health Management Teams, District Authorities and Health facility Staff in all districts visited. I'm also very grateful to the MoH leadership for advice and sound directions that made the entire exercise successful.

I wish to express my most sincere gratitude's to WHO both regional and country offices for their untiring support both financial and technical, also for exceptional guidance, throughout the entire exercise. Without this support it would have not been possible to reach this output.

Evidently, this Review would not be possible without the availability of data. Therefore I convey my great thanks to the various thematic team members led by their Coordinators, Local and External consultancies. I wish to stress that, what they did in data collection, gathering of information and analysis was systematically and technically well done. I would like to express my sincere appreciation for the active participation to all

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stakeholders involved in the formulation of this review. It would be impossible to thank everybody in person on this page and therefore I refer for a detailed list of people, who spend their invaluable time to assist us, to the annexed list of consulted persons and thematic team members.

Specifically, however, I want to thank the people from the ZMCP well organized by their Program Manager. These officers made themselves available and therefore facilitated logistics and other in house support that enable to produce this document in time.

Lastly, I know, there are so many people involved in the process but on behalf of all of them, let me once again thank all members involved in final report writing. They really deserve special credit for their commitment, they worked day and night in compilation of this document ensuring all information are well captured.

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Abbreviation

ACT	Antemisinin-based Combination Therapy
AQ	Amodiaquine
AS	Artesunate
ACSM	Advocacy Communication Social Mobilization
BBCC	Behavior Change Communication
CMS	Central Medical Store
CQ	Chloroquine
DANIDA	Danish Development Agency
DHMT	District Health Management Team
DMO	District Medical Officer
EHCP	Essential Health Care Package
EPR	Epidemic Preparedness and Response
EQA	External Quality Assurance
GFATM	Global Funds for AIDS Tuberculosis and Malaria
HIMS	Health information Management System
HIV	Human ~~Immune~~ Immunodeficiency Virus
IEC	Information Education and Communication
IHI	Ifakara Health Institute
IMCI	Integrated Management of Childhood Illnesses
IQA	Internal Quality Assurance
IRS	Indoor Residual Spraying
LLINs	Long lasting Insecticidal Nets
LSM	Larvae source management
MDG	Millennium Development Goal
MEEDS	Malaria Early Epidemic Detection System
PERSUAP	Pesticide Evaluation Report and Safer use action Plan
MiP	Malaria in Pregnancy
MoH	Ministry of Health
MCH	Maternal and Child Health
MPR	Malaria Programme Review
MSD	Medical Store Department
OPD	Out Patient Department
PMI	President's Malaria Initiative
PER	Public Expenditure Review
RDT	Rapid Diagnostic Test
RTI	Research Triangle International
SCHCS	Shehia Custodian Health Committee
SHRR	Strengthening of Human Resource for Health
THIS	Tanzania HIV and Malaria Indicator Survey
UNICEF	United National Children Fund
USAID	United State Agency for International Development
WHO	World Health Organization
ZFDB	Zanzibar Food and Drug Board
ZHSRSP	Zanzibar Health Sector Reform
ZMCP	Zanzibar Malaria Control Programme
ZILS	Zanzibar Integrated Logistics System
ZMCC	Zanzibar Malaria Coordinating Committee
OCGS	Office of Chief Government Statistician
PHB	Private Health Board
GFCCM	Global Fund Country Coordinating Mechanism

Comment [o1]: Please correct alphabetic order

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Executive summary

In June 2011, the Ministry of Health of Zanzibar under the auspices of the Zanzibar Malaria Control Programme, key partners and stakeholders commenced the exercise of a malaria programme review to evaluate the progress and overall performance, identify key achievements, critical issues and obstacles to future success, and in addition, to propose solutions to improve performance for reaching malaria free Zanzibar. Since 2008, Zanzibar has been implementing the current National Malaria Strategic Plan, which outlines the reorientation of essential programs in case management, vector control, surveillance, and health promotion towards the goal of achieving malaria free Zanzibar. Malaria elimination is recognized as a priority in the national development and health agenda by the policy makers and development partners.

The findings from the review showed that there is strong leadership in the programme which provides policy guidance, resource mobilization, and overall program oversight for all malaria control interventions. There is a malaria strategic plan and implementation guidelines which integrates reproductive and child health delivery services. The Ministry of Health and Zanzibar Malaria Control Programme have achieved the global, MDGs and Abuja targets for malaria control, including the attainment of near zero deaths due to malaria. The malaria infection level in the population has declined from greater than 10 % in 2005 to less than 2% in 2010, whereas the incidence of new malaria episodes has reduced from 16/1000 to 2/1000 in children under five years and from 4/1000 to 2/1000 in above five years. Therefore malaria is no longer a major public health problem. This current low malaria burden is associated with scaling up the delivery of malaria interventions since 2005 with greater than 75% coverage with Long Lasting Insecticidal Nets (LLINs), more than 94% with IRS and screening of all fever cases for malaria with RDTs and treatment with ACTs. The success was possible due to substantial political, financial and technical support from the national and international partners.

Despite the commendable achievements, the program relies heavily on external funding which may be unsustainable for the shifts towards malaria free Zanzibar. Malaria still remains highly unstable in nature with an annual risk of "unusual increases" and potential outbreaks. The procurement and supply chain management for malaria commodities and supplies is weak including logistics management information system which is still at pilot stages. There is no official documentation of technical specifications for all malaria commodities. Despite World Health Organization's (WHO) recommendation to countries to ban Artemisinin monotherapies to preserve efficacy of ACTs, its importation and use continues. As ZMCP moves towards malaria pre-elimination phase the capacity in districts is not optimal to conduct rigorous surveillance required. No epidemic preparedness and response plan to mitigate malaria epidemics are in place.

As malaria infection and cases continue to decline, they tend to be focalized, there is therefore a need to stratify malaria by the lowest administrative areas (Shehia) within districts to identify foci of transmission for targeted interventions to achieve maximum impact. Strengthen surveillance system to detect and contain upsurges timely is of most important. The government of Zanzibar needs to increase funding for malaria control to ensure sustainability of the achieved gains.

The review team has put forward some recommendations and action points which will guide the program's new strategic orientation of moving from the current control towards a malaria free Zanzibar.

Comment [o2]: When you want to eliminate a disease, you can't say it's no longer a public health problem. If this is true you don't need to eliminate it.. In elimination program even one case is a problem (see polio). This statement is in contradiction with the conclusion on page 27 where it is stated that "In Zanzibar, malaria continues to be a priority communicable disease of public health importance"

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1. Introduction

1.1 Background

Malaria has been a major cause of illness and death in Zanzibar and therefore, the disease remained a major impediment to social economic growth and welfare for many years. To reduce the burden of malaria, the Revolutionary Government of Zanzibar, has undertaken considerable efforts supported by various local and international partners including stakeholders to fight against the disease burden.

The ZMCP implements a current Strategic Plan, covering the period of 2008-2012. The goal is to significantly reduce morbidity and mortality due to malaria in the population of Zanzibar with special attention to the most vulnerable groups- children under five, pregnant women and the poor-and in so doing, promotes economic development. To contribute towards achieving this goal, the ZMCP continue to employ effective interventions such as use of ACTs for malaria treatment, scaling up of LLINs, Behavioural Change Communication and Surveillance, Monitoring and Evaluation.

Following the deployment of these interventions in wide scale, the malaria prevalence as well as malaria positivity rate has significantly decreased since 2007 (less than one percent to the general population,) to a level whereby is no longer a major public health problem. At present, the main focus of ZMCP is to vigorously monitor malaria trends (surveillance) and preparedness to epidemic and response

1.2 Malaria Programme Reviews

Malaria programme reviews are periodic, collaborative evaluations of national control programmes. Their aim is to improve ~~operational~~ the program performance in term of policies, strategies and the delivery of malaria control interventions in order to reduce morbidity and mortality. For the purposes of this review, the malaria control programme includes the government and all partners and stakeholders in malaria control at national, sub-national and community levels. The programme review is done in order to identify achievements in outcomes and impacts, best practice and lesson learnt critical issues, problem and cause of problems. Solutions can then be proposed for more effective delivery, resulting in revision of programmes and strengthening of structures, system and capacity to achieve great equity, better coverage, higher quality and more effective delivery of anti-malaria intervention.

1.3 Justification

There are clear evidences of malaria decline in the country documented through various studies and surveys. Health facility sentinel sites findings as well as information from health facilities implementing Malaria Early Epidemic Detection documented significant malaria reduction on both Islands. In recent years, Zanzibar has brought malaria burden to very low levels, prevalence of less than 1%, in this regard malaria transmission has changed from high to low level. Based on these achievements and in line with the Global Malaria Programme/WHO recommendations towards malaria elimination agenda, the malaria programme review remains important. This calls for intensive assessment of the current strategies and activities with a view of re-orienting the program and systems used in delivery of interventions. Hence Zanzibar is applying for GF-R11, the MPR output enables the programme to find out what is not working and why and also proposes solutions to major challenges or barriers to elimination continuum.

1.4 Objectives of the MPR

The objectives of the MPR were:

- To review the current epidemiology of malaria in Zanzibar
- To review the structure, organization, and management framework for policy and programme develop within the health system and the national development agenda
- To assess progress towards achievement of national, regional and global targets
- Review the current program performance by intervention thematic areas and by service delivery
- To define the next step for improving programme performance of redefining the strategic direction and focus, including revising the policies and strategic plans
- To disseminate the MPR outputs and translate findings for realigning malaria control strategy in Zanzibar based on the current situation.

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1.5 Methodology of the MPR

Essentially, the program review is conducted in four phases; Planning and Preparatory, Internal thematic desk reviews, Joint programme field reviews and lastly report writing, dissemination of results, implementation of recommendations.

Review Process, Task Management and Coordination

The entire review process organized and led by the Zanzibar Malaria Control Programme, five members of MPR secretariat selected to plan and oversee the entire process and its implementation at all levels. District health teams were fully involved during district filed work and dissemination meeting of the MPR output. To ensure maximum of involvement of all key players, a stakeholders meeting conducted to inform the importance and rationale for MPR to all interested parties and organisation working in the field of malaria.

Appointment of review coordinator

The review coordinator was selected by the Zanzibar Malaria Control Programme Management team who was working closely with the Programme Manager to coordinate day to day MPR process for implementation.

The Internal review and thematic team

Internal review teams of five members in total formed for each intervention units (thematic area) existing in ZMCP. Each thematic area had a team leader and other members from those thematic areas joined by professionals from in and outside of the MoH such as academic and research institutions. The thematic review teams were formed by five members.

The external review team

The external review team consist of invited experts from outside of the country, the ZMCP requested for external Consultant from WHO. Following this request, seven consultants joined the MPR review teams and worked closely with the programme manager.

Phase I: Preparatory and planning

Preparatory phase started in June, 2010 by proposal development. The proposal was prepared by ZMCP in collaboration with malaria control partners and stakeholders. Administratively, the MPR proposal was submitted to the MoH for blessing and thereafter a financial request forwarded to the relevant sources of funds.

In March 2011, the consensus building meeting with partners and stakeholders was conducted. All partners agreed to conduct the MPR in Zanzibar, the meeting was attended by representatives from WHO, MoH Zanzibar, Ifakara Health Institute, John Hopkins University, Clinton Foundation, Italian Cooperation, PMI/USAID, CHAI and Danida.

During stakeholders meeting it was agreed to carry out MPR in six districts out of ten districts of Zanzibar namely Urban, West, North-A, North-B, Central and South of Unguja. Pemba districts were not involved due to logistic reasons.

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Phase II: Internal thematic desk review

This phase involved desk review by thematic areas based on programme data, reports, published and unpublished literatures, plans and proposals. Documents and published literatures, updating country databases and country profiles, mapping of population risk, estimating burden and projection, policy and management analyses and special studies individual consultations and provincial and district field visits with interview and observations.

The review teams were assigned responsibilities as per Terms of Reference. Each thematic group had a chairperson and rapportour. Thematic team leaders were responsible for reporting to the secretariat and writing a final thematic review report and then submitted it to the consultant. The amended checklist were prepared to suit the respective context in each thematic area used to assemble information from field to verified information collected from available documents and reports.

The following thematic areas were selected for review:

1. Programme management, Procurement and Supply of Malaria Commodities
2. Diagnosis and Case management including malaria in pregnancy (prevention and treatment)
3. Malaria Vector Control
4. Advocacy, Information, Education, Communication and Community Mobilization
5. Epidemiology, Surveillance, Monitoring and Evaluation, Operational Research, Epidemic Preparedness and Response.

Phase III: Joint programme field reviews

In this phase, field visits in all 6 districts were conducted. Members from each internal team form part of the consolidated field team, which constituted of both the internal reviewers and external members. Before the visit, briefing done to familiarise teams with the whole MPR process, field data collection tools and required reports from the field visits as well as final required reports. The teams had an opportunity to interview various stakeholders within and outside the ministry of health. These include development partners such as WHO and UNICEF and other government and non-government institutions and CSOs.

Phase IV: This phase includes follow up of the all action points and recommendations suggested during the MPR process

1.6 Outline of the report

This report provides the description of entire review findings. The information was stipulated in a logical and sequential manner based on the thematic areas as mentioned above. Under each thematic area, a brief introduction was stated followed by other important concepts such as policy guidance, organizational structures and detailed SWOT analysis. Finally recommendations were provided for programmatic purposes.

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2.

3. Context of malaria control

Brief description of what has happened in malaria control in the country over the last 10-15 years with emphasis on the past 5 years:

3.1 Historical milestones in malaria control

Malaria control in Zanzibar is a national priority and it's also a national agenda

3.2 Malaria control within the national development agenda

3.3 National health policy

3.4 National health sector strategic plan

3.5 National development plan

3.6 Organizational structure for malaria control

3.7 Key strategies for malaria control

3.8 Key players in malaria control

3.9 Linkages and coordination

3.10 Conclusions and Recommendations

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4. Epidemiology of malaria in Zanzibar

4.1 Malaria parasites

The primary malaria parasite species is *P.falciparum.* The current microscopy diagnosis and reporting system does not identify and report on type of species. The RBM indicator survey of 2007 reported a high prevalence of 23% *P.malariae* parasites. Other malaria species *P.vivax* and *P.ovale* were not reported in malaria indicator survey. Simple operational research study with a network of hospital laboratories is required to clarify the role of other species of parasites. Since the change of treatment policy in 2003, ~~T~~there are no reports ~~since 2003~~ of parasite resistance to ACT combination therapy in use. Efficacy testing studies are under way to monitor efficacy and effectiveness of current antimalaria medicines.

4.2 Malaria vectors

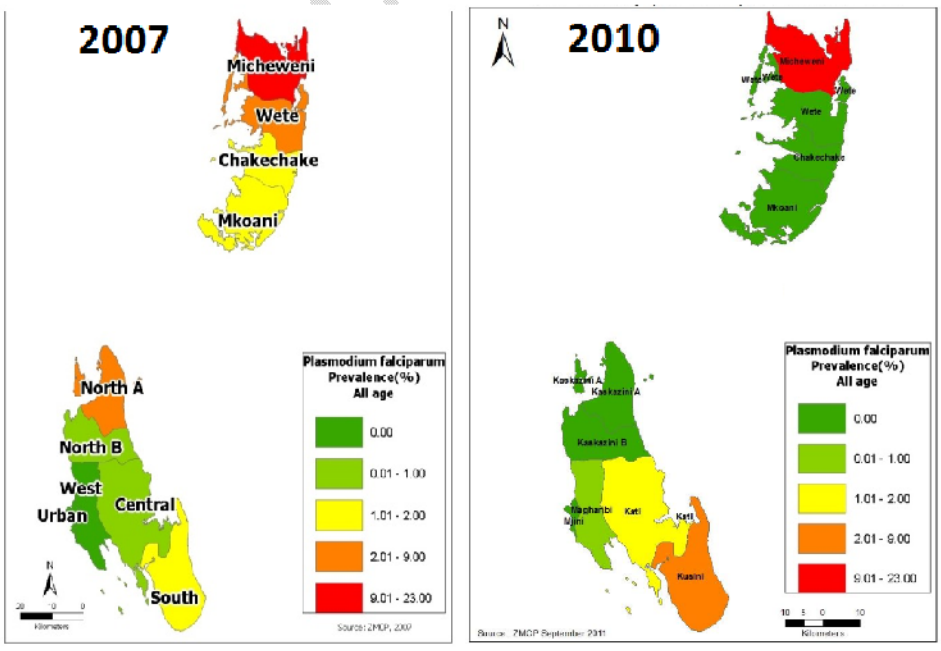
Entomological surveillance though seven sentinel sites indicates that the primary vector in 2010 is *An. arabiensis (89%)* with *An. merus* (7%) and *An. gambiae (4%).* In 2005 the primary vector was *An. gambiae* (95%) with *An. arabiensis* (4%), An. merus(0%) and *An. Quadrianalatus* (1.3%). This shift in proportion of vectors (i.e. *An. Arabiensis and An. gambiae)* from 2005 to 2010 ait consistent with the changes in malaria transmission levels from high to moderate *(14% 2003 to less than 1% 2010).* The vectors responsible for previous perennial transmission *An. funestus* are rare or may have been eliminated. Identifying and targeting malaria foci with both adult and larval vector control interventions may assist to eliminate An. Gambia in the future. In 2010 pyrethroid resistance and reduced susceptibility to organchlorines has been confirmed in Pemba.

Comment [o3]: This should be reflected as a weakness under the thematic area "case Management"

4.3 Malaria prevalence

The prevalence of asymptomatic infection in the general population has declined from as high as above 25% in 2005 to less than 1% in 2010 (Figure.1).

Figure 1: Malaria parasite prevalence 2007 and 2010



Source: ZMCP community base malaria survey 2007 and MIS 2010.

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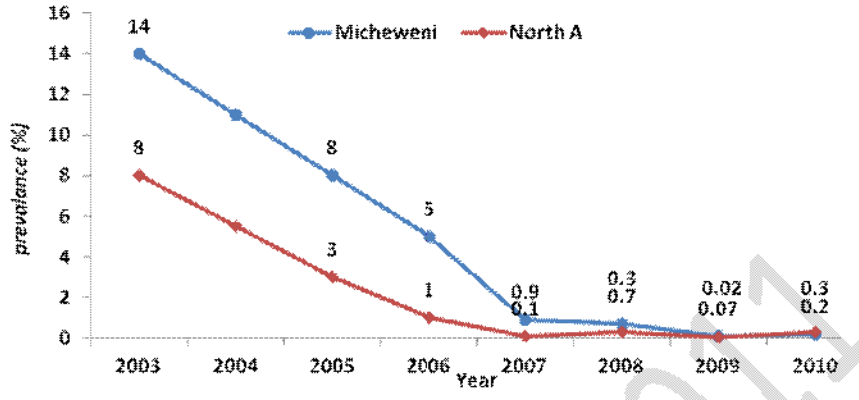
Prevalence monitored through two districts household sentinel sites indicates a sharp decline in prevalence from 14% and 8% in 2003 to 0.3% in 2010 (Figure.2).

Figure 2: Household Prevalence of P. falciparum in two Districts of Zanzibar, 2003–2010

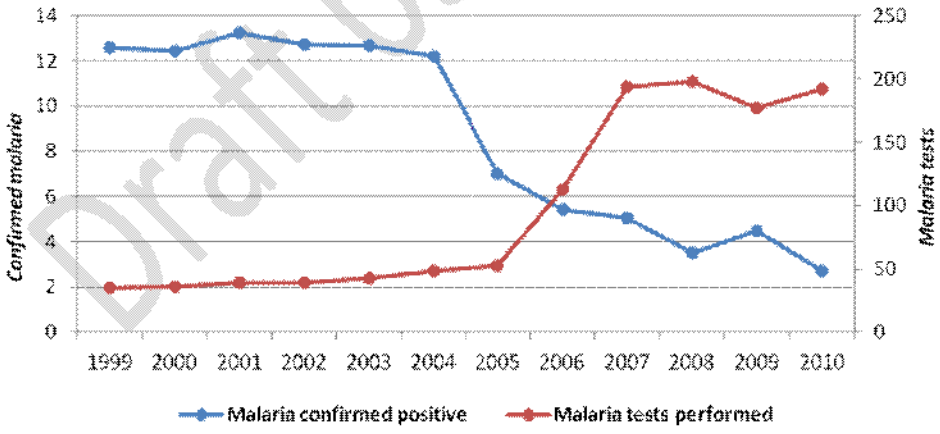


Source: ZMCP sentinel site monitoring, 2010

4.4 Malaria positivity rate (Slide and RDT)

Access to testing malaria with RDT has been scaled up to high levels since 2006(Figure.3). Malaria case definition has been changed in 2009 where suspected clinical malaria and presumptive diagnosis is no longer accepted. All reporting and disease surveillance is based on definite diagnosis with RDT or microscopy. The policy is that all fever cases seen in health facilities are tested for malaria. There has been intensive health worker orientation and training with public education to ensure that only confirmed malaria cases are treated with ACT.

Figure 3: Malaria tests performed and confirmed malaria positive ('000), all age groups, 1999-2010



Source: ZMCP, 2010

Malaria positivity rate in all age groups rapidly declined from 37% to 2% between 1999 and 2010 but has remained steady between 2007 and 2010 at 2-3% (Figure. 3). The positivity rate is slightly higher in over five year age groups as compared to under five years. This also indicates current low transmission levels of malaria.

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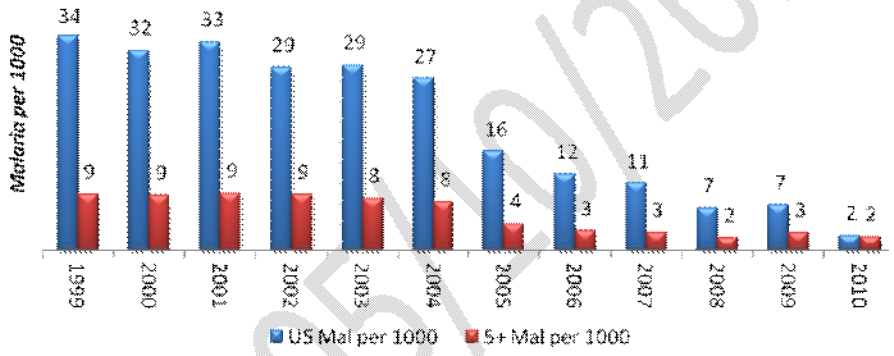
4.4.1 Confirmed malaria incidence

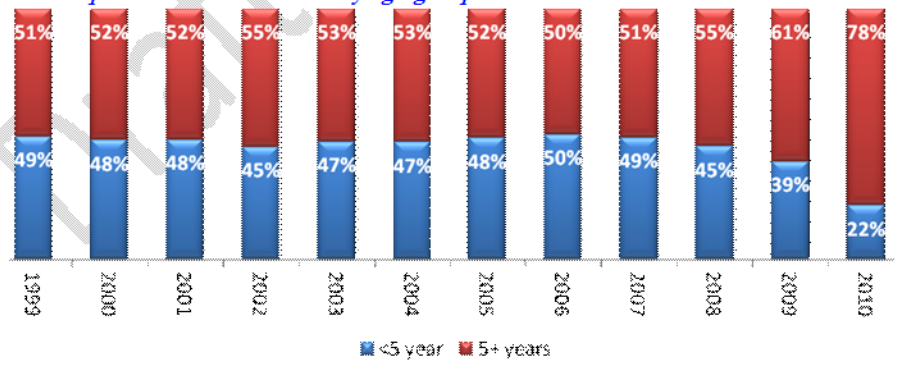
Malaria incidence reported from health facilities has declined rapidly between 2005 and 2010. The incidence in under five years has been eight fold decreased from 16/1000 to 2/1000 and in over five years from 4/1000 to 2/1000 between 2005 and 2010 respectively (Figure. 4) The decline has been mostly marked in the under five year age groups who accounted for 4839% of the cases in 2009 and 22% in 2010 indicating the shift in level of transmission from high to moderate or even low (Figure 4 and 5). This impact is attributed to rapid scale up with high coverage of a combined package of interventions (ACT, LLIN and IRS). The malaria incidence per 1000 population in 2010 was 2‰ both for under five year of age and the rest of the population (figure 4). This reflect the change in the level of transmission and the equal distribution of the malaria risk in the different age groups.

Figure 4: Incidence of malaria cases per 1000, 1999-2010



Source: ZMCP/HMIS, 2010

Figure 5: Proportion of malaria cases by age-group 1999-2010



Source: ZMCP/HMIS, 2010

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4.4.2 Annual malaria outpatient trends

Outpatient attendance from all causes has remained steady. Malaria as proportion of all cause attendance has declined rapidly from 23% in under five years and 27% in over five years in 2004 to 1% and 2% respectively in 2010 (Table.1). Currently, malaria is not among the top ten causes of outpatient attendance and a major work load burden in health facilities.

Table 1: OPD malaria patterns by age groups, 1999 –2010

	Under five years					Five years and above				
Years	All Visits	confirmed and un confirmed Malaria	Total Malaria test	Malaria Confirmed cases	percent	All Visits	confirmed and un confirmed Malaria	Total Malaria test	Malaria Confirmed cases	percent
1999	314,331	130,796	17,150	6,177	36%	583,085	165,874	17,494	6,414	37%
2000	225,049	124,471	17,769	5,923	33%	391,075	161,320	17,784	6,509	37%
2001	261,398	132,259	19,500	6,350	33%	423,114	169,498	19,800	6,902	35%
2002	295,942	132,107	19,584	5,719	29%	440,699	167,864	19,726	7,008	36%
2003	302,651	134,730	21,062	5,976	28%	442,664	166,440	21,752	6,692	31%
2004	377,320	147,316	24,448	5,724	23%	456,607	178,416	24,234	6,493	27%
2005	394,841	108,212	26,958	3,397	13%	451,796	122,054	25,965	3,616	14%
2006	346,403	84,484	55,729	2,710	5%	428,631	89,790	57,211	2,721	5%
2007	303,974	50,215	97,303	2,458	3%	415,123	53,373	96,589	2,591	3%
2008	291,091	42,596	99,778	1,586	2%	567,546	45,708	98,311	1,925	2%
2009	355,516		81,556	1,766	2%	539,471		95,681	2,745	3%
2010	387,495		87,549	584	1%	605,471		104,166	2,131	2%

Source: ZMCP/HMIS, 2010

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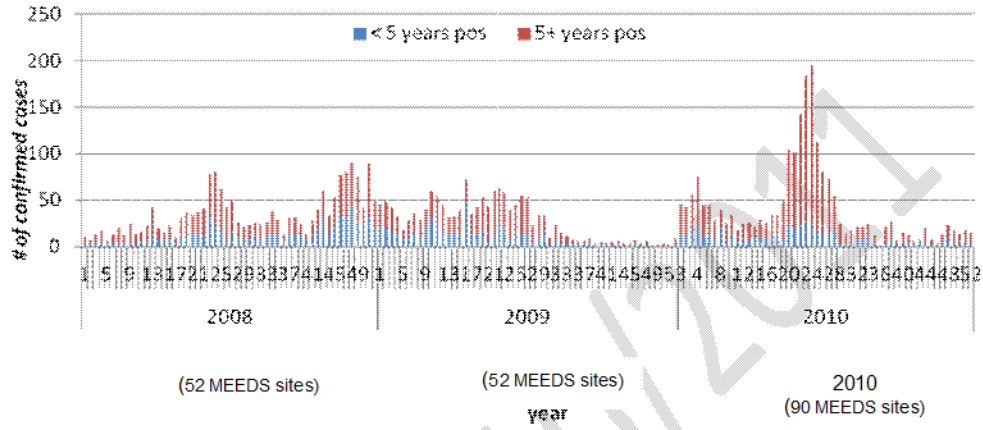
4.4.3 Weekly malaria outpatient trends

The weekly trend in confirmed cases and positivity rate starts going up at the end of the long rains which commences mid March to mid June with a sharp increase between week 21 to 29 followed by a sharp decline (Figure. 8) The second transmission peak (Sept-Nov) in the year overflowing into early part of the new year following the end of the short rains has now almost disappeared and not noticeable in the national trend.

Figure 6: Weekly positive confirmed malaria cases in MEEDS Health Facilities



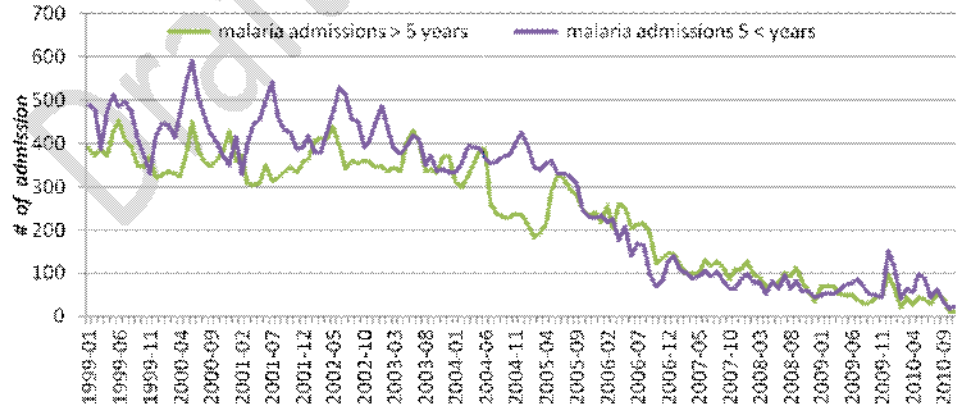
Source: MEEDS, 2010

4.4.4 Malaria inpatient admissions and death trends

Malaria admission and deaths used to account for 30-50% of all admissions and deaths but this started to decline in 2005-2006 (Figure 7).

Proportion of admission due to malaria has reduced to 13.4 % in over five years and 4.5% in under five years in 2010.

Figure 7: Monthly malaria admissions by age groups 1999-2010



Source: HMIS, 2010

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The numbers of deaths associated to malaria has not been reported in the last two years 2009 and 2010 for both age groups.

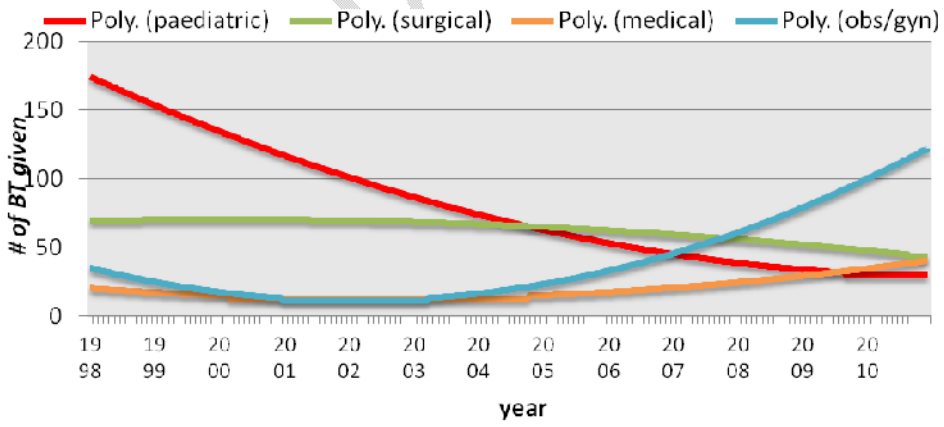
Table 2: Hospital reported deaths versus malaria specific deaths by age groups, 1999-2010

Years	5 < years			> 5 years		
	All deaths	malaria	%	All deaths	malaria	%
1999	494	226	45.7	279	146	52.3
2000	490	252	51.4	246	127	51.6
2001	439	249	56.7	263	141	53.6
2002	420	232	55.2	276	142	51.4
2003	305	178	58.4	292	130	44.5
2004	321	187	58.3	336	125	37.2
2005	319	163	51.1	294	84	28.6
2006	243	88	36.2	208	49	23.6
2007	187	36	19.3	201	28	13.9
2008	186	23	12.4	193	6	3.1
2009	139	0	0.0	127	0	0.0
2010	114	0	0.0	209	0	0.0

Source: HMIS, 2010

The decline of paediatric hospital admissions has been accompanied with decrease of blood transfusion needs in children with severe malaria, while medical transfusions requirement have continued to increase, with a sharper increase in transfusions in obstetrics (Figure 8).

Figure 8: Blood Transfusions trends through 1998-2010



Source: Mnazi mmoja Referal hospital blood transfusion monthly records, 2010

1.1 Annual seasonal trends

In Zanzibar both malaria incidence and malaria positivity rate show that malaria transmission continues year round. Increased seasonal malaria transmission starts with the long rains in March-April with a peak as the rains decline during May to July (Figure.11). There is also a second low seasonal increase in malaria

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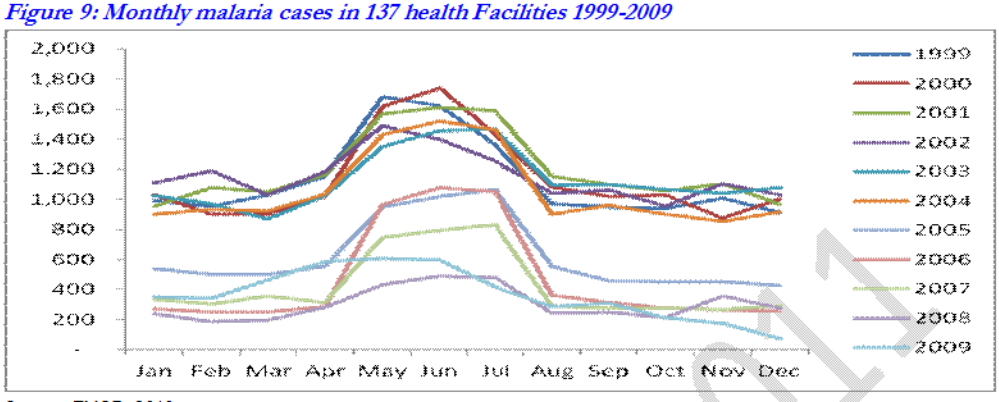
transmission associated with the short rains. Although the overall magnitude of malaria burden has declined the sharp seasonality and risk of outbreaks remains high during the period May to June.

Figure 9: Monthly malaria cases in 137 health Facilities 1999-2009

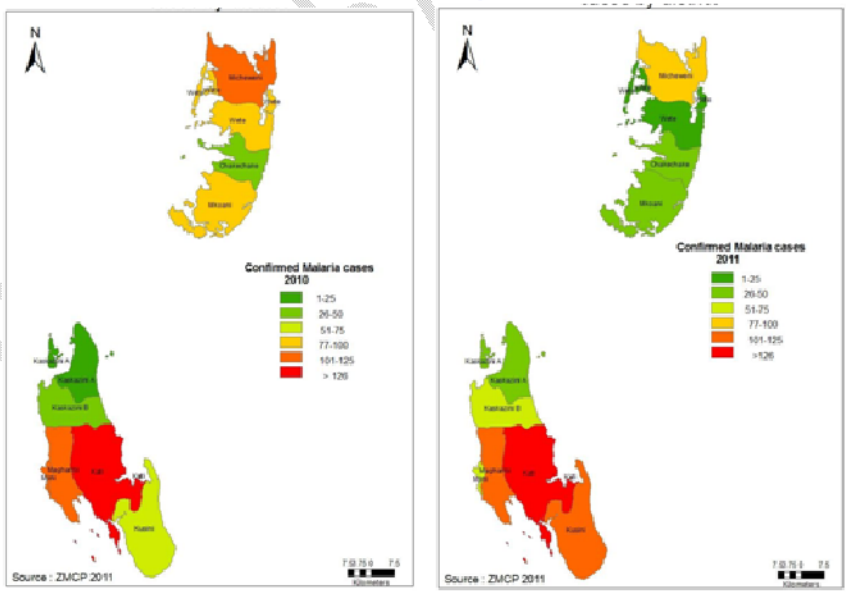


Source: ZMCP, 2010

1.2 Spatial malaria distribution

Malaria incidence is high in Unguja as compared to Pemba. In Unguja the highest malaria incidence has been reported in central districts and linked to irrigation schemes and presence of seasonal labour. In Pemba, high incidence of malaria cases is documented in Micheweni District.

Figure 10: Annual malaria confirmed cases stratified by district – 2010/11



Throughout the MEEDS implementation, the ZMCP has been identifying facilities with continued malaria transmission. These facilities are regarded as malaria hotspots sites. Currently, there are eight hotspots (Jendele, Uzi and Dunga from Central District, Fuoni Kibondeni and Kombeni in West district, Bumbwini in North B and finally Tumbe and Shumba vyamboni in Micheweni District). Following the implementation of aggressive

interventions Bumbwini hotspot was removed in the list after significant reduction of transmission.

1.3 Malaria Stratification

An ecological map of Zanzibar was not readily available during the review exercise. The two islands experience differences in annual rainfall, temperatures and humidity. Similarly, there is variation of vegetation from North and South districts, and between the western and the eastern coastlines. The distribution and density of the main vector might be associated with these ecological differences and may result in different natural malaria epidemiological patterns. The current epidemiology will be modified a result of the background ecology and the access and coverage to malaria control interventions.

In 2010 marked malaria incidence was documented in South Unguja, Central and Micheweni (Table 3).

Table 3: District malaria incidence

Districts	2008	2009	2010
Central	5.6	3.9	7.2
Chakechake	0.8	1.6	0.9
Micheweni	1.4	1.6	2.8
Mkoani	0.7	0.2	1.2
North a	1.2	0.8	0.5
North b	8.6	6.3	1.7
South	1.5	1.2	3.4
Urban	0.8	0.2	1.0
West	0.3	0.4	1.5
Wete	1.3	1.3	1.2

Based on the available malaria incidence by districts can be classified into high transmission areas (API>3/1000), Moderate (API 1-2/1000) and low (API<1/1000) (Table 4). North A, Chakechake and Urban districts have reached incidence levels below 1/1000 and may not have local indigenous transmission. Districts of Wete and Mkoani may be approaching local elimination. The momentum of districts along the control and elimination continuum could be further analysed by incidence levels by Shehia and targeting of combination of both malaria parasite control and vector control in malaria foci.

Table 4: Stratification of malaria risk by district (n = 10)

Year	High < 3	Moderate 1 - 3	Low < 1	Sporadic	Free
2008	2	4	4	-	-

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2009	2	4	4	-	-
2010	3	5	2	-	-

1.4 Conclusion

In Zanzibar, malaria continues to be a priority communicable disease of public health importance. The continuing circulation of parasites in the population and presence of malaria vectors in a favourable tropical environment, both of which support a high malaria transmission potential. The total population of 1.2 million people in all ten districts are considered at risk of malaria caused primarily by *P. falciparum* and some *P. malariae*. The primary malaria vector now is *An. arabiensis*. The occurrence of *An. gambiae s.s.* and *An. funestus* israre. An effective malaria control program has reduced malaria burden to the current low case load with limited annual seasonal increase. Health facility outpatient attendances and admissions due to malaria have declined sharply with near zero reported deaths. The malaria infection level in the population has declined from greater than 10 % in 2005 to less than 1 % in 2010 at community!. Incidence of new malaria episodes has reduced from 16/per 1000 to 2/1000 in under- five children and from 4/1000 to 2/1000 in age groups above five years. The absolute number of malaria cases has declined from 7013 to 2715 cases and from 247 deaths in 2005 to **no reported deaths in 2010**. Malaria is no longer a major public health problem in children and in pregnant women; however it affects all age groups. This current low malaria burden is associated with scaling up delivery of malaria interventions since 2005 with greater than 75% with LLINs, more than 94% with IRS and screening of all fever cases for malaria with RDTs and treatment with ACTs. As malaria infection and cases continue to decline, they tend to be focalized. There is therefore need to stratify malaria by lowest administrative areas (Shehia) within districts and to identify foci of transmission for targeted combination of interventions for maximum impact. Malaria still remains highly unstable in nature with an annual risk of "abnormal increase" and potential for outbreaks at the end of the annual rainy season during the months of May to July and possible resurgence back to year round high transmission. It's important to note that the gain against malaria is very fragile and need to be sustained and expanded to avoid any resurgence

1.5 Recommendations

i. ZMCP should generate an updated malaria stratification maps by Shehia for targeted application of a combination of interventions for maximum impact.
ii. DHMTs should conduct weekly mapping of all confirmed cases by health facility to identify malaria foci or hot spots for pro-active house hold screening to eliminate asymptomatic infections.
iii. All confirmed malaria cases in districts with an annual incidence of less than 1 per 1000 should be notified within 24 hours and investigated and responded within 48 hours.
iv. All severe cases and deaths admitted to hospitals should immediately be notified to ZMCP for investigation to prevent future deaths
v. and sustain near zero deaths due to malaria

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1. Programme performance by thematic areas

1.1 Programme management

1.1.1 Introduction

Malaria in Zanzibar was a major public health and social development problem affecting the entire population. It was until late 1990s, when intensive malaria control efforts increased with jointly implementation between the Government of Zanzibar, partners and key stakeholders. This resulted in significant achievements in terms of reducing disease burden as well as reaching national and international targets.

In the past five years there has been a significant increase in financial support from development partners as well as the Government of Zanzibar. With these resources, the country has been able to achieve a substantial reduction in malaria prevalence. Based on the current available information, the pattern of malaria endemicity in Zanzibar is changing from hyper/holo-endemic to hypo-endemic. This new setting has created the potential for malaria elimination in Zanzibar.

1.1.2 Policy

Three documents underpin national priorities in addressing health priorities; the Health Sector Strategic Plan II (2006/7-2010/11), the Health Sector Reform Strategy (ZHSRSP II) and the Essential Health Care Package (EHCP).

The main emphasis of health sector reform is to increase efficiency in service provision and utilization of financial resources. The reform measures maintain a particular emphasis on access to quality health care, with a particularly emphasis on primary health care, for the poor, women of reproductive age, children and other vulnerable groups. The ZHSRSP II and the EHCP focus on developing a basic health care package which includes the following aspects:

i. Addressing the major health problems or common diseases on the islands including malaria
ii. Ensuring cost-effectiveness by targeting preventive, promotive, curative and rehabilitative interventions that will significantly contribute to reducing the burden of disease
iii. Improving equity
iv. Integration of vertical programmes in planning, implementation and logistics management, to increase effectiveness and minimize programme costs
v. Greater emphasis on safe motherhood and child survival, by extending coverage of maternal and child care to the whole islands (antenatal and post natal services, ITNs/LLINs, immunization and IMCI)

Both the ZHSRSP II and the EHCP have been developed based on:

i. A multi-sectoral approach to the planning, implementation, monitoring and evaluation of health services
ii. Political commitment and civil society involvement
iii. Community participation will be actively sought and promoted.
iv. Ensuring that comprehensive basic health services shall be accessible to all

To focus attention on critical aspects of the health system and its beneficiaries, six main themes have been identified to be emphasized over the coming five year period. These are:

i. Strengthening human resources for health (HRH)

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ii. Strengthening decentralised health service delivery
iii. Ensuring coverage for vulnerable groups
iv. Improving efficiency through integration
v. Improving transparency, accountability and partnership
vi. Monitoring and Evaluation

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1.1.3 Organization

1.1.3.1 Organizational Structure of the Ministry of Health

The ZMCP falls under the Directorate of Preventive Services and Health Education within the Ministry of Health Zanzibar (MoH).

The Directorate of Preventive Services aims at reducing the burden of disease attributable to communicable and non-communicable diseases through the following strategies:

i. Use of integrated primary health care approaches to prevent, control and manage all diseases
ii. Uses varieties of health educational strategies that involve the community in health promotion and the prevention of diseases
iii. Establish an integrated decentralised health care system with defined interventions packages for each level (i.e. primary, secondary and tertiary levels)
iv. Develop the technical support services as essential elements of health care process

These strategies applied to all MoH Programs including ZMCP, in implementation of their day to day activities. The organogram of the ministry is shown in Annex 1.

1.1.3.2 The Organizational Structure of ZMCP

The ZMCP has the functional role of coordinating malaria control activities in the country. The scope of the ZMCP mandate is clearly described in the Zanzibar Malaria Control Strategic Plan 2007-2012 and Zanzibar Health Sector Reform Strategic Plan II 2006/07-2010/11. The core functions of the ZMCP program include:

i. Facilitating the development of malaria control policies, strategies and guidelines
ii. Coordinating and overseeing the malaria control activities of all implementing partners and organizations at all levels including the districts;
iii. Setting standards, norms, and indicators to monitor the progress of program implementation;
iv. Resource mobilization
v. Capacity-building and technical assistance for the implementation of activities Coordinating a research agenda and facilitating the translation of the findings into policy; and
vi. Advocacy for malaria control to keep it high on the national and development agenda

ZMCP infrastructure

The ZMCP has a new and modern three floor office block, with enough working space. In this new building the programme has full air conditioned rooms, two conference halls, and a equipped parasitology laboratory and insectary. The laboratories support quality assurance and quality control for diagnostic services, entomological and insecticide resistance monitoring. Building has installed 24 hour broadband internet services, power backup generator.

On the other hand, the programme office on Pemba island although older, has reasonable infrastructure. Both offices are equipped with necessary working facilities to enhance implementation of planned malaria interventions. These include vehicles and motorbikes for day to day office and field activities. Periodically, extra transport is hired for activities with huge logistics requirements like IRS and LLINs mass distribution campaigns.

The ZMCP has central warehouses in each zone for storage of malaria commodities, located within MoH compound. There is a new Equipment Maintenance Workshop (Health care engineering unit) which is located within the MoH central garage. This Workshop is used by the program to maintain vehicles, IRS pumps.

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1.1.4 Human resources, training and capacity development

The management team of ZMCP consists of 28 programme officers including the program manager and other heads of programme units. Table 1 shows the distribution of the current ZMCP staff by skills. The organogram of the ZMCP is shown in Annex 2 The structure and staffing of ZMCP has put in place the framework for the programme to carry out its key functions and activities. The current ZMCP team working together with partners has been able to meet its major planning and implementation targets despite the human resource gaps.

Table 5: Personnel at the ZMCP

Officers	Required	Present	Gap
Programme Manager	1	1	0
Deputy Programme Manager	1	1	0
Programme Administrator	1	0	1
Accountants	2	1	1
Internal auditor	1	0	1
Cashiers	4	2	2
Medical Doctor	3	1	2
Assistant Medical Officer	2	1	1
Procurement Officer – Pharmacist	2	1	1
Epidemiologist	1	0	1
M &E Specialist	1	0	1
M &E Officers	4	2	2
Laboratory Quality Manager	2	0	2
Public Health Officer	8	6	2
Laboratory technologist	6	2	4
Laboratory technician	10	6	4
Entomologist	2	2	0
Vector control Officers	3	2	1
Health Education Specialist	1	0	1
Sociologist/Anthropologist	1	0	1
TOTAL	**56**	**28**	**28**

The current organizational structure includes six units under program manager (sub-office Pemba, financial department, case management unit, entomology/vector control unit, IEC/ BCC unit and surveillance, M&E unit). The ZMCP currently has inadequate number of personnel, specifically in areas of epidemiology, monitoring and evaluation, health planner and internal auditor. These gaps were identified for filling in the 2008 -2012 ZMCP Strategic Plan but have not yet been filled by the Ministry of Health. Training of existing staff can ultimately build technical capacity for the programme.

The programme review found that the ZMCP had one epidemiologist seconded to assist the programme by PMI, but lacked dedicated technical staff to handle monitoring and evaluation, epidemic preparedness and response activities. The human resource gap for laboratory is also very important.

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1.1.5 Strategic and annual planning

The ZMCP is currently implementing the 2008-2012 National Malaria Strategic Plan whose development was guided by various policies and strategies prepared in line with national and international conventions, declarations and policy documents; that include:

i. The Constitution of Zanzibar, Zanzibar National Health Policy (1999)
ii. The Public Health Act
iii. The 1st and 2nd Health Sector Strategic Plans
iv. Vision 2020, the Zanzibar Poverty Reduction Plan,
v. Millennium Development Goals (MDG),
vi. The Abuja Declaration.

All these policies and strategies give priority to both control and elimination of malaria in Zanzibar. The ZMCP develop annual work plans based on the overall Strategic Plan to execute activities focusing on all agreed interventions. The second Zanzibar Poverty Reduction Plan (Zanzibar Strategy for Growth and the Reduction of Poverty-), under Cluster 2, aims at:

1. Reducing incidence of malaria cases from 0.9% in 2008 to 0.5% by 2015
2. Increasing percentage of under five sleeping under ITNs from 80% in 2009 to 100% by 2015

Working tools: The ZMCP has developed technical guidelines for the following intervention areas; Malaria Diagnosis and Treatment, Information, Education and Communication/BCC, Vector Control (IRS and ITN/LLINs), Monitoring & Evaluation and Malaria in Pregnancy.

However some of these guidelines especially the IRS and MiP guidelines were not available at the lower levels during the review period.

Annual operational plans

A comprehensive annual plan incorporating various activities supported by different donors is prepared based on national strategic plan in collaboration with various stakeholders within and outside the ministry. At program level the plan is monitored on weekly basis and annual reports are prepared and disseminated to all key stakeholders and partners. At the departmental level a monthly meeting is organized to assess implementation status of health sector programs and units. At the ministerial level a joint annual review meeting is conducted to evaluate MoH plan of actions from various programs including Malaria. Technical advice to the program officers is provided accordingly.

2.1.1 Implementation structures

ZMCP is supporting districts through Zonal Health Management teams. There are two Zones in Zanzibar (Unguja and Pemba) with 6 districts and 4 districts each respectively. Each district is run by a District Health Management Team (DHMT) headed by a District Medical Officer who is overall in charge of all health related activities, including malaria. The DMO is supported by 5 other officers (District Health Administrator, District Health Officer, District Public Health Officer, District Health Material Manager and the District Financial Officer).

The ZMCP monitors the programme in the Shehias on monthly and quarterly basis through Shehia Custodian Health Committees (SCHC). These committees are being established by MoH in collaboration with local district authority through the community health strategy which aims at 'streamlining' the existing structures in creating a common framework for the coordination of the various health interventions.

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The SCHC acts as the Shehia advisory board for all health affairs in their locality. The committee collaborates with health workers in planning and implementation of malaria services delivered to the community. The MPR found that whilst the SCHCs have been established in most of the districts, their collaboration seems to be mainly with the national office (ZMCP) than with the DHMTs, when it comes to malaria implementation of IRS and LLIN mass distribution.

Partnership and coordination

The ZMCP is working with a number of partners and receives financial and technical support from the Ministries Departments and Agencies, internal and external development partners. However, ZMCP is largely dependant on external support mainly from development partners. A clear strength of the ZMCP is its ability to mobilize and focus partners around completion of a major task. Implementing partners all expressed the need for more effective program coordination by the ZMCP.

Multilateral organisations in supporting the malaria programme include GFATM, UNICEF, WHO and African Development Bank (ADB), whereas key bilateral organisations are PMI/USAID, JICA, Danida and the Italian Cooperation. Research institutions providing technical assistance are Public Health Laboratory-IdC, ZAMRUKI, MUHAS, NIMR, CDC, IHI, and RTI. Table 7 shows a detailed list of partners and their areas of support.

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Table 6: List of Partners in Malaria Control during ten years 2001-2010 – (Past and Present)

Name of Agency	Type of Agency	Main technical focus
Government Ministries	**Government**	**Planning, Administration and implementation**
ADB	Bilateral Organization	Financial support
AMREF	International NGO	Monitoring Laboratory Quality assurance
CDC	Bilateral	Research activities, entomology Monitoring
CHAI	International NGO	Technical and Financial support
Danida	Bilateral	Health Systems Strengthening
GFATM	Multilateral development partner	Strengthening Health system (Malaria prevention and treatment)
IHI	Research Institution	Research Activities
Italian Cooperation	Bilateral Organisation	Capacity building, logistics support.
JICA	Bilateral Organisation	Capacity building and logistics
Karolinska Institute, Sweden	Academic	Training and operational research
MEDA	International NGO	Prevention: Introduction of LLINs Voucher Scheme
Media	Government / Private Institutions	Public advocacy
MUHAS	Government Training and Research Institute	Research activities and Training
Pemba Health Laboratory – IdC	Government Research Institution	Operational research
PSI	International NGO	Social marketing of insecticides
RTI	Research Institution	Research activities and malaria prevention
UNICEF	Multilateral development partner	Prevention through community based programmes, care, training and
USCF	Training and Research Institute	Research activities and malaria prevention
USG PMI/USAID	Bilateral	Prevention: IRS, Community based activities, Case management
World Health Organisation	Multilateral development partner	Prevention, Treatment, Capacity development, logistic etc
ZAMRUKI	Research Institution	Research activities
ZAMWASO, TUISHI, JUMABWE, ISTIQAMA, ZAMELSO, ZACA, ZAFFIDE, CSO, BUKIDO, MASEPA, NOAC, WAMATA, AMS, ZANA, PIRO, JUMAZA, YODESO.	Local NGOs/ CSOs	Prevention and Service delivery: Community based malaria control, prevention and also quality assurance

2.1.2 Financing

2.1.2.1 Government expenditure on health in Zanzibar

The Zanzibar Public Health Sector is funded through a mix of financing mechanisms, including general revenue of the Revolutionary Government of Zanzibar (RGoZ) 35-40%, external funding through development partners (DPs) 60-65%, and cost-sharing (1%).

Although the RGoZ is committed to increase the share of expenditure in the health sector as recommended in the Abuja Declaration, it is still below 15% of Abuja Target and 12% of Health Sector Reform Strategic Plan II (HSRSP-II) Target. This situation diminishes the ability of the sector to reach its target including ZMCP targets. Table 4 shows the total expenditure in health from financial year (FY) 2004/5 to 2009/10 while table 5 shows the proportion of Government expenditure on health.

Table 7: Total Estimated Health Expenditure, FY 04/05 – FY09/10

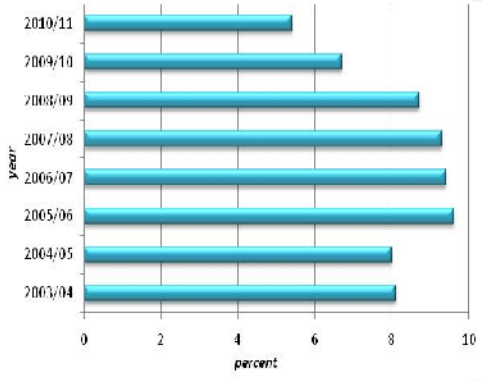
Financial Year	Total Expenditure (Millions TShs)	Total per capita expenditure (Tshs)
2004/05	15,717	15,717
2005/06	16,742	14,976
2006/07	13,886	12,022
2007/08	19,999	16,758
2008/09	30,000	25,000
2009/10	31,040	28,200

Source: PER 2009/2010

In nominal terms, actual expenditure for the health sector has doubled over the six years but if inflation is considered, the growth is only slight and even falls in some years. The per capita expenditure to health in 2010 was US $ 19.2[1] which is less than half of the recommended US $ 40 by the WHO Commission for Macroeconomics and Health[2].

Development partners contribute about 60-65 percent of the health sector budget. Figure 14 shows the trends of development assistance by various partners in thousands of US dollars from FY 2004/2005 to FY 2008/2009.

Figure 11: Proportion of Government expenditures for health, 2003 - 2010



Source: PER 2009/2010.

[1] Ministry of Health and Social Welfare (2011) 'Public Expenditure Review 2010' MOHSW, Zanzibar
[2] WHO (2001) 'Investing in health for macro-economic development: Report of the Commission on Macroeconomics and Health http://whqlibdoc.who.int/publications/2001/924154550x.pdf

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Figure 12: Contributions of Development Partners to Health

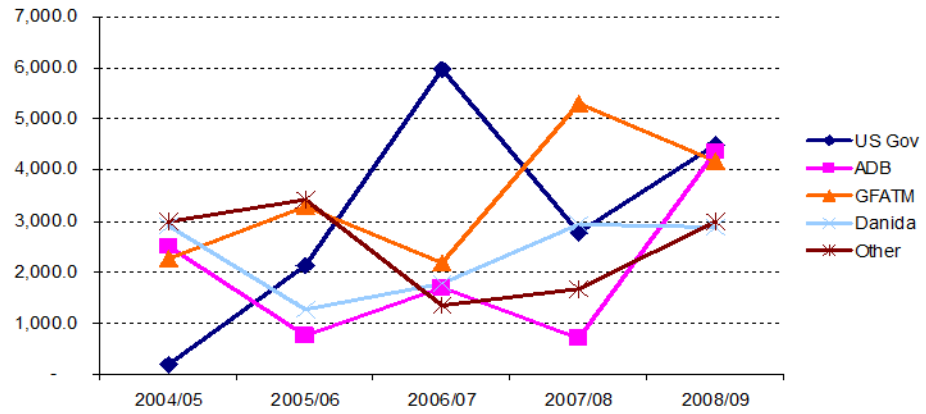
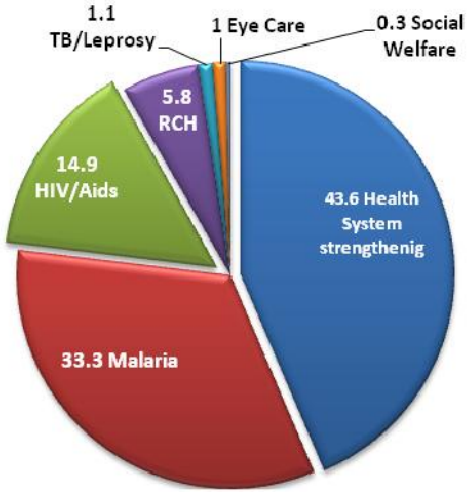


Figure 13: Resource allocation to different health areas

2.1.2.2 Resources for the Malaria Control Programme

The ZMCP receives resources for malaria control from both the Revolutionary Government of Zanzibar and external partners like the GFATM, PMI, and multilateral UN agencies such as WHO and UNICEF. Figure 13 shows the contributions of the partners from 2006 to 2010



Source: PER, MoH 2009

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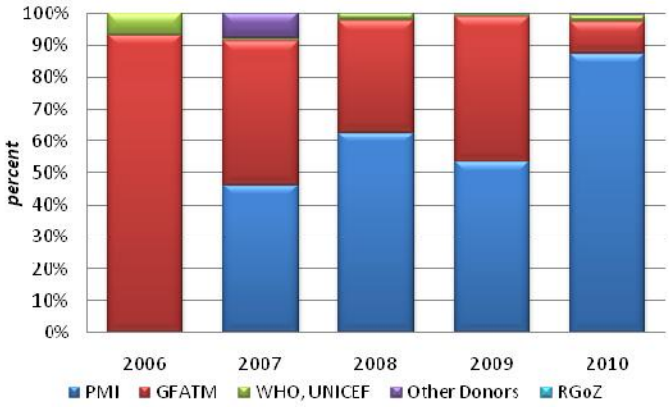
Figure 14: Contributions from partners to malaria control 2006-2010

The support from the RGoZ is currently about 1% and consists of is personnel emoluments for programme staff. Contributions towards the health system are not taken into account. Programmatic interventions are almost entirely dependent on external resources which can be unpredictable and therefore unsustainable.



RGoZ and HSF

In 2004, the MoH[3] introduced Health Services Fund (HSF) as a district funding mechanism which is an entry towards SWAp. This is a common funding mechanism for district level health service delivery, allows for greater targeting of resources towards more marginalized districts in Zanzibar based upon poverty and disease burden. The Danish International Development Assistance is the only external partner contributing to this fund since inception. In 2010 the ZMCP, with support from Global Fund round 8 malaria HSS grant is contributing to the HSF. The resources are managed by the DHMTs and are channelled through respective Zonal Health Management Teams This HSF is specifically earmarked for interventions focused on women, children under five and other vulnerable groups. It supports the improvement of services at outpatient departments and clinics at Primary Health Care Units (PHCU) in the districts.

At its introduction, a significant proportion of the OPD consultations at district and primary level facilities were due to malaria. Improvements in the quality of services provided and its utilization by the community members has had a positive effect on malaria control. The malaria grant contribution to the HSF is mainly used to improve the timeliness of community health care seeking behaviour which can also be supported through community systems strengthening activities under an expanded HSF. The ongoing health sector reforms will lead to the scale up of the sector wide approach (SWAp) for the financing of activities.

The Global Fund to fight AIDS, TB and Malaria (GFATM)

The ZMCP has received financial support from the GFATM from 2002 through rounds one, four and eight grants making it the largest source of funding for malaria control activities in Zanzibar. For rounds 1 (100%) and 4 (94.%) of the grant amount were disbursed and used. For the ongoing round 8, only 1 disbursement (41%) for year 1 has been received and this is affecting implementation of activities and grant performance. The Global Fund resources were instrumental for the implementation of a new national antimalarial treatment policy with ACTs and the scale up to universal coverage with LLINs. Other areas supported include training of health

[3] MoH and MoHSW are interchangeably used to mean ministry responsible for health

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workers, and monitoring and evaluation of implemented activities.

President's Malaria Initiative (PMI)

PMI funding in Zanzibar has mainly been for IRS operations, entomological monitoring, and insecticide resistance monitoring and malaria diagnosis. In the financial year 2006/2007 for example, about US $ 3,962,000 was spent on these activities. IRS for malaria vector control will continue in Zanzibar for as long as entomological surveys justify its need. Other areas of interventions supported by PMI are malaria case management including diagnostics and behavioural change communication activities.

UN Agencies

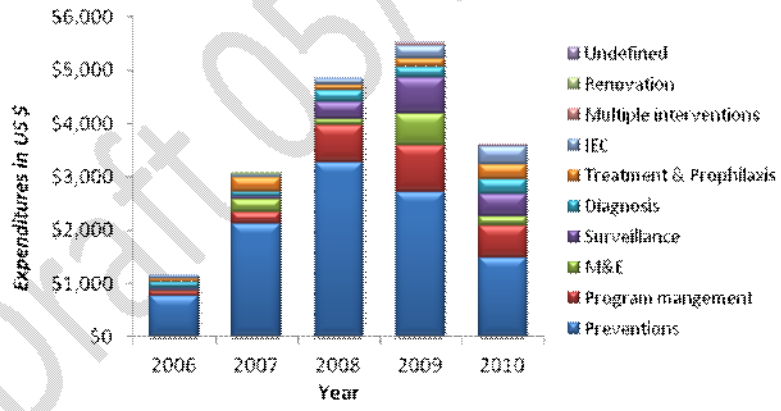
UNICEF provides both technical expertise and donations of malaria commodities (LLINs) for pregnant women. They also support community based malaria activities including school health education.

WHO avails technical expertise in all the major interventions (eg case management, resource mobilization etc) from Headquarters, AFRO region and the WHO country office.

2.1.2.3 Public Expenditure Review 2006 to 2010

The ZMCP conducted its first Public Expenditure review in 2011 which covered all expenditure by intervention in the previous five years (figure 15)

Figure 15: Malaria expenditure by activity/intervention, ('000), 2006-2010



Source: Malaria Control Financial Sustainability Report, ZMCP 2011

Prevention has been the main driver of the expenditure for almost five years (57.2 percent). However in 2010 delay of fund from GF has contributed to low expenditures on this particular intervention. The average per capita expenditure on malaria is USD 2.77. The dotted line in 2010 represents activities which were planned but not implimented due to delayed disbursement of funds from the Global Fund.

The expansion of malaria control interventions and preparations to reorient the programme towards malaria elimination has caused the ZMCP to face financial constraints. New interventions like active

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surveillance and operations research face the dual challenge of inadequate financing as well as insufficient technical expertise (advanced malaria surveillance towards elimination) for implementation. There is an urgent need to strengthen the capacity within the ZMCP for operational research and surveillance activities.

Dependence on external resources is a risk due to volatility and unpredictability as well as changes in development partners policies and priorities . With the visible decline in Malaria, the RGoZ may no longer consider funding for malaria activities a priority. No studies have been conducted in Zanzibar to show the link between the prevalence of malaria and economic growth or poverty. The impact of malaria control on education has been well documented in a report entitled "*Country Brief: Maintaining the Gains in Malaria Control*" showing that school absenteeism and intellectual impairment which are important determinants of future earning and productivity, have improved as malaria reduced. Although the globally recommended interventions for malaria control are proven to be effective, the ZMCP has gone ahead and done a cost benefit analysis of the introduction of rapid malaria diagnostic tests in view of the reduction of the malaria burden*.

2.1.2.4 Financing for malaria elimination

In 2009, an assessment study was conducted to look at the possibility of domestic financing for the elimination of malaria in Zanzibar (table 6). The study led to the development of a Malaria Control Financial Sustainability Plan[4]. The plan identifies four possible sources of domestic funding:

i. Earmarked tourism tax (tourist should pay USD 10 for malaria control)
ii. Endowment /Trust fund: The RoGZ and development partners allocate investment funds. The interest or profit accruing will be used by the ZMCP
iii. Emergency Debit Fund: Donors establish an emergency fund in a bank. ZMCP can then draw some funds from this account regularly.
iv. Regional Funding Pool: A basket investment funds designed to attract funding from countries that will benefit from the elimination of malaria from Zanzibar.

Table 8: Estimated cost in US $ for sustained control and elimination

Year	Cost of sustained control (US $)	Cost of elimination (US$)
2011	3,872,779	4,813,838
2012	3,872,779	4,889,659
2013	3,872,779	4,930,251
2014	3,940,438	4,644,804
2015	3,940,438	4,678,270
2016	3,940,438	4,712,554
2017	4,010,244	4,789,909
2018	4,010,244	4,825,915

* Msellem MI, Martensson A, Rotllant G, Bhattarai A, Stro¨mberg J, et al. (2009) 'Influence of Rapid Malaria Diagnostic Tests on Treatment and Health Outcome in Fever Patients, Zanzibar—A Crossover Validation Study'. PLoS Medicine 6(4): e1000070. doi:10.1371/journal.pmed.1000070

[4] Ministry of Health (Draft) 'Zanzibar Malaria Financial Sustainability Plan

Draft 05/10/2011

2019	*4,010,244*	*4,862,829*
2020	*4,082,264*	*4,344,664*

Source: Malaria Control Financial Sustainability Report, ZMCP 2011

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2.1.3 Best practices

The malaria programme in Zanzibar has strengthened the health system for service delivery by mobilizing resources for establishment of community health structures, the SCHCs, supporting disease surveillance and reporting, and contributing to the HSF that supports district health team planning, implementation and monitoring of health interventions. More specific ZMCP has increased its capacity in human resource through various long term trainings. The programme has also provided support for capacity strengthening of the CMS through grants from the Global Fund. The ZMCP's involvement of communities in advocacy, planning and implementation of malaria control interventions has ensured wide acceptance and positive action by communities for vector control and prompt treatment seeking and active case detection.

2.1.4 SWOT Analysis

Programme management

STRENGTHS	WEAKNESSES
a. Community involvement in planning and implementation of malaria control interventions b. Financial support from development partners for malaria control and elimination c. Adequate physical infrastructure d. Availability of a national health policy, malaria strategic plan and implementation guidelines. e. Political and Government commitment to support malaria elimination f. Sufficient warehousing and efficient distribution of malaria commodities to points of use g. Availability of local skilled personnel experienced in malaria control h. Strong health care infrastructure and system	a. Insufficient involvement of DHMT in the implementation of malaria activities b. Low proportion (1%) of domestic financing for malaria control c. Human resource gaps in epidemiology, monitoring and evaluation and epidemic preparedness and response d. Lack of guidelines for epidemic preparedness and response while guidelines for vector control and malaria in pregnancy guidelines need updating e. Low capacity for quantification and procurement for malaria commodities f. Lack of documentation of technical specifications for malaria commodities
OPPORTUNITIES	**THREATS**
a. Malaria prevalence and incidence has significantly declined and has been maintained at a low level, feasible for elimination b. Strong weekly malaria reporting and surveillance system c. Strong public health infrastructure from national to community level d. Decentralized health system allows regions to coordinate and receiving funding from HSF e. Presence of Zanzibar Strategy for Growth and the Reduction of Poverty addressing malaria in health sector components including malaria f. Adequate physical infrastructure for the national programme	a. Declining malaria prevalence puts the entire population at risk of malaria epidemics b. External financing for malaria commodities is unpredictable and unsustainable c. Frequent redeployment or posting of key staff within the MoH d. Inadequate staff remuneration

Comment [o4]: 1.Opportunities should be limited to external factors: What are the opportunities that will facilitate the program ability to perform its mission
2.What can of resource the program might have access to?
3.Which partners are ready to work with you? What interesting new development is happening
This applies to all SWOT analysis tables

Comment [o5]: 1.What are the external factors – political, economic, and social, that affect the program ability to perform its mission?
2.How might the national and global economic situation affect our effort?
3.Is the political situation going to affect the program?
4.What obstacle does the program face?
Are partners doing something different to the program priorities
This applies to all SWOT analysis tables

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2.1.5 Key issues

Programme strategies like IPTp may need to be evaluated and reviewed in line with the prevailing epidemiology. Guidelines for LLIN distribution and maintenance of universal coverage, and integrated vector management incorporating vector source management are lacking. There is no formal interagency coordinating mechanism for malaria control at the MoH incorporating all partners to oversee planning, implementation and performance monitoring for activities. In addition, there is need for technical working groups in the various areas to support the interagency coordinating mechanism.

The programme has impressive physical infrastructure and human resource, but lacks some skilled personnel like epidemiologists and M&E specialists. The programme also directly coordinates implementation of activities at community level with minimal involvement of district teams due to human resource capacity at that level.

The Ministry of Health has done well to evaluate the feasiblity of malaria elimination and the financial requirements including exploration of possible sources of funding to sustain it. Currently however, the programme is almost entirely dependent on external financing which is unpredicable, unstable and unsustainable.

2.1.6 Conclusion and recommendations

With the successful control of malaria, the Zanzibar Malaria Control Programme can re-orient to eliminate malaria. In line with this vision, new policies and strategies will need to be developed and implemented including; surveillance for all populations including migrants and strengthening of community based activities. The recommendations from the review are:

1. ZMCP should develop a national malaria policy guidelines in line with prevailing epidemiology to guide the development of appropriate strategies for implementation
2. MoH should increase human resource capacity at district level to coordinate comprehensive malaria elimination activities thus strengthening the ownership and involvement of the DHMT.
3. MoH should recruit and deploy epidemiologists and M&E specialists to the national programme to support the implementation of an elimination strategy, and in particular to coordinate epidemic preparedness and response, active surveillance and performance monitoring of the strategies to control and or eliminate malaria
4. to increase Government of Zanzibar through MoH to increase financing for malaria control in order to ensure sustainability of a malaria free Zanzibar. Donor funding is fraught with unpredictability and sustainability issues.
5. ZMCP should update Malaria in Pregnancy and the Vector Control guidelines.
6. There is need for ZMCP to expedite the completion of the Malaria Epidemic Preparedness and Response guidelines, Diagnostics Quality Control as well as the LLIN distribution guidelines.

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2.2 Procurement and supply of malaria commodities

2.2.1 Policy

The Zanzibar Ministry of Health through the Central Medical Stores (CMS) is responsible for the procurement of commodities in collaboration with Procurement Unit of the MoH. The CMS is therefore responsible for supply of commodities including malaria products to district facilities. The Public Procurement and disposal of public Assets Act No. 9 of 2005 and Regulations (Under section 47).

2.2.2 Registration of products

The ZFDB is responsible for registration of health and non health commodities and supplies. Medicine registration, as part of medicine quality assurance, falls under the ZFDB. The ZFDB collaborates with the Tanzania Food and Drug Authority (TFDA) whereby registered medicines from the Tanzania mainland are also approved for circulation in Zanzibar market for both public and private health facilities. TFDA laboratory has been pre-qualified by WHO in year 2011.

Specifications

Specifications for medicines including malaria products are developed by the ZFDB in collaboration with the ZMCP. Specifications for the procurement of LLINs, insecticides and pumps are purely developed by the ZMCP and partners in line with the WHO standards and guides.

2.2.3 Quantification

Forecasting and quantification of ACTs and RDTs is done on an ad-hoc basis using both consumption and morbidity data by the CMS and the ZMCP staff. Quantification for LLINs and IRS commodities is done by the ZMCP vector control unit in collaboration with Research Triangle International.

There have been difficulties in forecasting the quantity of products required for malaria control particularly in relation to ACT and RDT consumption due to poor reporting on consumption of medicines. There is no tool to measure ACT consumption and such a system could help track actual consumption of all major essential medicine dispensed in front line health facilities. There is a need to improve information returning to the CMS to inform its forecasting and quantification estimates. It is anticipated that the continued development of the HMIS and the support being provided to districts from the Health Services Fund will strengthen both the quality and quantity of information flowing from the districts to the CMS and ZMCP which, in turn, will improve the accuracy of the forecasting process.

2.2.4 Procurement, storage and distribution

Procurement of malaria commodities is based on a current PSM plan 2010 which is developed annually. The CMS is responsible for all procurements except for commodities procured by PMI funds while the Ministry of Health and the CMS is responsible for Global Fund supported ACTS and RDTs. Due to long tendering processes and inadequate capacity at the CMS, in 2010, the programme and the Global Fund agreed to procure ACTs and LLINs through Voluntary Pooled Procurement managed by Population Services International in Washington.

2.2.4.1Tendering

The ZMCP engages consultants for the administration of the procurement procedures with the CMS including the preparation of bidding of documents, the evaluation of the bids, preparation of contracts and negotiation of contracts. For

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goods and services whose cost USD 10,000 and above request for quotations from at least three pre-qualified bidders may be used otherwise open tenders are advertised.

The MoH Ministerial Tender Board evaluates and awards all tenders for the procurement of commodities (Mosquito nets (LLINs), Rapid Diagnostic Tests (RDT) and ACTs and services supported by the Global Fund. The ZMCP members are invited to provide technical explanation or the goods to be procured.

2.2.4.2 Supply and distribution of commodities

Following the award of tenders, all suppliers are required to adhere to the contracts stipulating quantities and delivery schedules. The CMS works together with the ZMCP to ensure proper storage and distribution of commodities. The Zanzibar CMS operates with two stores. The current storage capacity is 400 sq meters at CMS Unguja and 140 sq meters at the Zonal Medical Stores, Pemba. Supplemental storage facilities are available at the ZMCP head quarters in Unguja which have mainly been used for the storage of LLINs and IRS equipment. While the storage facilities in all locations are not ideal, they are adequate for the requirements of the malaria programme. Furthermore, medicines and health products are distributed directly from the CMS stores to the health facilities on a quarterly basis reducing the need for extensive stores at facility level.

4.2.4.2.1 Distribution of medicines and consumables

The distribution of commodities is done directly from central level to health facilities through a push system where kits are pre-packed and delivered to the different levels of health care every quarter. In 2011, the CMS began a pilot of a pull system and use of the Zanzibar Integrated Logistics System (ZILS) with 19 PHCUs on both islands. There are no significant challenges in distributing products to health facilities as the road network is quite extensive and in relatively good condition on the two islands. Moreover, there are no significant challenges for accessing health facilities by the population. The analysis of the 2004/05 Household Budget Survey shows that 96.9 percent of households are within 5kms of a primary health care centre and 100% of the population live within 10 Kms of a health facility.

4.2.4.2.2 Distribution of LLINs and IRS commodities

Distribution of vector control commodities is done directly by the programme using private sector transportation. Inadequate capacity (human and logistics) at district level to distribute the required commodities to the warehouse hamper smooth delivery of the services. In this regard, district teams are mainly involved in the initial planning of IRS and LLINs mass campaigns.

Monitoring and supervision

The CMS is responsible for providing technical support and supervision of the District Materials Managers who supervise health facilities monitoring commodity stocks. Due to financial constraints, supervision has not been carried out.

2.2.4.3 Status on availability of malaria commodities

At the time of the programme review, there were sufficient stocks of RDTs for general use among the population and LLINs for distribution to pregnant women at ANC and commodities for IRS at central level. There was however a stock out of ACTs in most health facilities in Zanzibar. The stock out was due to a five month delay in deliveries of 150,000 doses of ACTs procured through the Global Fund Voluntary Pooled Procurement (VPP). However, ACTs were available in most of the private facilities through AMFm project. Some facilities also had stock outs of quinine and SP and this was attributed to the facilities not forwarding their requests to the CMS.

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Essentially, the MoH has never had a stock of malaria commodities in the past five years at all levels of service delivery points (MIS: 2007, 2010).

2.2.5 Quality Control

Quality control assurance for all procured malaria commodities is conducted in country by centres that are nationally, regionally or globally recognized. LLIN effectiveness is tested through bioassays by the ZMCP entomology unit. Medicines are tested by the ZFDB with support from the Tanzania Food and Drug Authority while RDTs are tested by the Bagamoyo Research and Training Unit Laboratory. Routinely inspection are conducted by the ZFDB in all private pharmaceutical outlets where by counterfeit products are confiscated and the responsible owner are held according to the ZFDB Act No. 2, of 2006

SWOT analysis

Procurement and supply of malaria commodities

STRENGTHS	WEAKNESSES
a. Sufficient warehousing and efficient distribution of malaria commodities to points of use b. Strong health care infrastructure and system c. Adequate physical infrastructure for the national programme ~~b.~~	a. Low human resource and technical capacity for quantification and procurement for malaria commodities at programme and Central level b. Lack of documentation of technical specifications for malaria commodities c. Absence of a stock management system d. Inadequate staff remuneration ~~d.~~e.
OPPORTUNITIES	**THREATS**
~~b.~~Adequate physical infrastructure for the national programme ~~b.~~a. Pilot of the Zanzibar integrated logistics management system (ZILS)	~~b.~~Inadequate staff remuneration ~~b.~~a. External financing for malaria commodities is unpredictable and unsustainable b. Delay in fund disbursement

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2.2.6 Issues and challenges

The procurement system for commodities is weak while the supply chain management system is strong with collaboration between the CMS, programmes and private sector ensuring timely delivery of commodities. Other issues include: quantification of commodities; the staffing capacity of the CMS needs to be improved; expansion of the logistics management information system; supportive supervision for commodity management at district level; documentation of technical specifications for all malaria commodities; delays in funding disbursements for commodities from some partners.

2.2.7 Conclusion and recommendations

The CMS has low capacity for quantification, procurement and management of commodity stocks. Distribution of commodities however takes place from central stores directly to health facilities.

The following actions are required:

1. MoH to strengthen the Central Medical Stores in terms of human resource and technical capacities for quantification, documentation of technical specifications, procurement of malaria commodities.
2. Zanzibar CMS to scale up the implementation of the pull system for commodity distribution and the integrated logistics management system. This should go hand in hand with the development of procedures for commodity management at all

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levels. These if implemented will address stock outs and expiries.

3. ZMCP should entrench routine support supervision for commodity management and district and facility level
4. ZMCP should define and publish specifications for all malaria commodities for Zanzibar.

2.3 Malaria vector control

2.3.1 Introduction

The major malaria vectors found in Zanzibar are *Anopheles arabiensis*, *Anopheles gambiae* complex. Zanzibar uses a combination of LLINs and IRS to control malaria which is transmitted by primarily *An. arabiensis* in the country. The role of *An. merus* in malaria transmission is still unclear and *An. funestus* and *An. gambiae s.s.* are becoming increasing difficult to detect because of the six years of intense LLINs and IRS implementation.

2.3.2 Policy and guidance

The ZMCP Strategic Plan (2008 – 2012) aims to reduce malaria prevalence by 70% from 2006 level (35%) to <1% in 2012 through implementing effective interventions including vector control among others. The ZMCP in collaboration with partners developed Guidelines for Implementation of Integrated Vector Control (2005), revised the Technical Guidelines for the Implementation of Insecticide Treated Nets (2009), IRS Guidelines and IRS Training Manual. The program in collaboration with partners organizes annual review and planning meetings that produce annual plans and reports

2.3.3 Organizational structure

The vector control unit is part of the ZMCP. It is responsible for the coordination of all malaria vector control activities in the country. Details are found in ZMCP organogram in Annex 2.

ZMCP conduct periodic spraying at district level. Before each IRS round several preparatory activities are conducted including training of trainers (TOT) followed by training of spray operators. Structured training manuals are used in these trainings where trainees are trained in IRS theory and practice to receive skills in spraying techniques including handling, operating and carrying of spraying pumps Detailed for team composition is found in table 11 below. All guidelines for IRS implementation are used to ensure appropriate management of insecticides. An operating manual/guide for the spraying operators translated into local official language (*Swahili*) is used to enhance understanding the IRS operation procedures.

In 2010, three ZMCP entomological staff members were trained by the Entomological Consultant from CDC Atlanta, USA on ELISA technique for the detection of malaria sporozoites in mosquitoes. During the same year, 8 ZMCP staff members attended training on Mosquito Biology, Ecology and Control that was conducted by NIMR, Amani Centre in Tanga Tanzania. Also another training was organized by ZMCP to orient 56 mosquitoes collectors (32 in Unguja and 24 in Pemba) from 7 sentinel sites (4 in Unguja and 3 in Pemba); using WHO learner guide of 1992. Insectary management training included, 3 Insectary Supervisors and 4 Insectary Attendants

2.3.3.1IRS team composition

There are 10 IRS camp sites, one in each of the 10 districts: 6 in Unguja and 4 in Pemba, subject of change depending on the need of the programme. The IRS district sites composed of a site manager, supervisors, team leaders, sprayer operators, sprayer technician, watchman, protective clothing washers and drivers. All IRS staffs are temporarily seconded and others are given short term contracts. The number of staff per each site differs according to the size of the district.

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Table 9: IRS team composition

District	Spray operators	Site Manager	Supervisors	Technicians	Suite Washers	Site guards	Drivers
North "A"	66	1	9	1	4	2	5
North "B"	46	1	7	0	4	2	4
Central	70	1	10	1	4	2	5
South	28	1	5	0	2	2	3
West	220	3	32	1	8	2	17
Urban	160	1	24	1	8	3	13
Micheweni	70	1	10	1	4	2	5
Wete	88	3	13	1	4	2	7
Chakechake	70	1	10	1	4	2	5
Mkoani	88	3	12	1	4	2	6
Total	**906**	**16**	**132**	**8**	**46**	**21**	**70**

Source ZMCP 2010

2.3.3.2 Transport for IRS activities

During IRS operations, the vehicles are hired from the private sector in collaboration with district authority. For each IRS round a total of 70 light trucks are hired. The hired vehicles are mainly used to transport spray teams and equipments from a warehouse to operational area. In addition, 23 program motor bikes are used for national and district supervisors for supervision.

2.3.3.3 ITN/LLIN team composition

The distribution of LLINs is done every three years in all 10 districts. The distribution campaigns are organized by ZMCP through the IEC/BBC unit in collaboration with local leadership, shehias community members (CORPS), NGOs and CBOs.

2.3.4 Vector control infrastructure

All spraying equipment and supplies are stored for safety and security in warehouses located in the West district of Unguja. In Pemba there is another sub main warehouse located in Wete district. Each district has got its own storage facility manned by a store keeper. Equipment and supplies stored in warehouses include insecticide, sprayer pumps and spare parts and protective gear for sprayer operator. Storage and maintenance of the equipment and supplies follow the requirements of PERSUAP.

2.3.4.1Mosquito insectary

Mosquitoes rearing activities started in June 2007 with colonies of *Anopheles gambiae* R-70, *Culex quinquefasciutus* and *Aedes egyptae* from TPRI Arusha Tanzania Mainland for research purpose. Unfortunately all the colonies collapsed due to insufficient technical expertise to handle the colonies. The local colony of *An. arabiensis* was established in February 2011. There is an animal laboratory for rabbits that are used to feed mosquitoes. Health check-up of the animals is done monthly by personnel from the Department Veterinary Services. The mosquito colony was used for contact bioassays to monitor residual effect of insecticides on treated surfaces (IRS and LLINs).

2.3.4.2 Laboratory

The ZMCP introduces ELISA techniques within the laboratory in 2010 with support from PMI/CDC Atlanta. The ELISA is used to detect sporozoites presence in female mosquito.

2.3.4.3 Sentinel sites

In Zanzibar there are 7 sentinel sites: 4 in Unguja and 3 in Pemba. The sentinel sites were selected based on the agreed criteria,

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previous malaria interventions and disease prevalence in the selected sites to ensure representativeness.

The sites are Stone town in Urban district, Uzini in Central district, Chaani in North A district and Mwera in West district in Unguja. Bopwe in Wete district, Vitongoji in Chakechake district and Mizingani in Mkoani district in Pemba. Other sentinel sites are used as hot spots such as Cheju in Central districts, Bumbwini North B district and Mtowapwani North A district in Unguja and Shumba vyamboni in Pemba.

There were six potential malaria vectors of malaria that were identified in Zanzibar in early 1900s: *An. coastalis (gambiae), An. funestus*, *An. mauritianus*, *An. maculipalpis, An. squamosus,* and *An. longipalpas*. However, only *An. gambiae* and *An. funestus* were found to be malaria vectors as confirmed by studies that were conducted between 1934 and 1937 in Unguja and Pemba islands. Subsequent studies from 1950-1980s showed that the 3 species of the *An. gambaie* complex; *An. gambaie ss, An. arabiensis* and *An. merus* were present in both islands of Zanzibar. In 2010 a total of 1542 mosquitoes were analyzed and the results showed that *An. Arabiensis* in Unguja (65%) whereas on Pemba (76%). *Anopheles merus* was found to be 4% in Unguja and 1% in Pemba.

Anopheles funestus, An. gambaie ss, An. arabiensis breed in borrow-pits, open swamps and shallow pools while *An. merus* breeds in blackish salt waters. *An. gambiae, An. arabiensis* and *An. funestus* are commonly endophagic and endophilic. Studies that were done in 2005 showed that 79.61% *An gambiae* s.l were fed with human blood and only 1.94% with bovine blood with a biting rate of 4.33 bites/person/night in Unguja and 100% human blood with a biting rate of 4.5 bites/person/night in Pemba. By 2008, the biting rates reduced to 0.2 bites/person/night in Pemba and to 0.54 bites/person/night in Unguja (Fig 16).

Figure 16: Man Biting Rate, pre (2005) and post (2008) IRS and LLIN scale up

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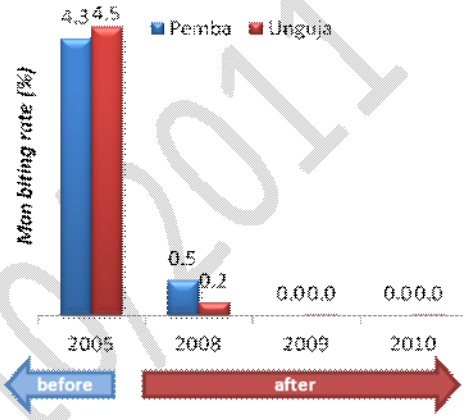

Source ZMCP 2006

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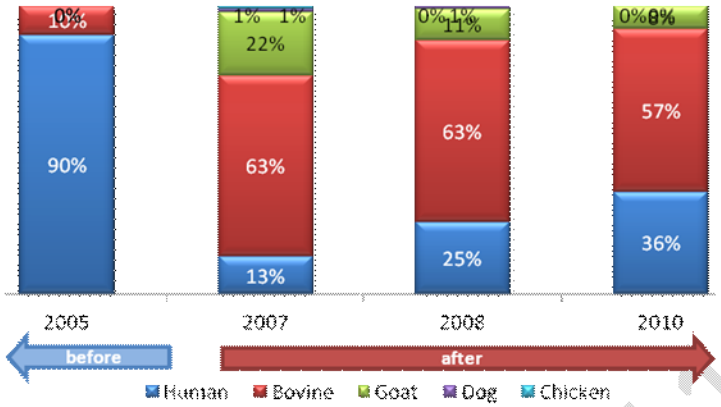
Figure 17: Distribution of Blood Meal before and after IRS and LLIN scale up



Source ZMCP 2010

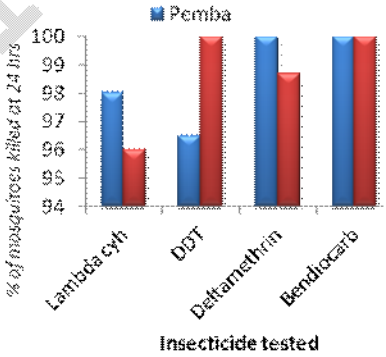
2.3.4.4 Sporozoite rate

In 1927 the sporozoite rate for *An. gambiae sl* was 7.3% and *An. funestus* was 6.9% in Unguja Island. However, there were no studies to determine the sporozoite rate in 1980s. In 2005 sporozoite rate was 2% in Pemba and 4.3% in Unguja for *An gambiae s.l.* In 2006 IRS was introduced and in 2008 sporozoite rate was 0.2% for Pemba and 0% in Unguja. In 2009, sporozoite rate in *An. arabiensis* was 0% in both Unguja and Pemba as reported from sentinel sites.

Vector susceptibility to insecticides

Susceptibility status of *An. gambiae s.l.* to DDT, deltamethrin and lambdacyhalothrin was 100% (Fig 18) in 2002. In 2008, the susceptibility was 100% for DDT and bendiocarb in Unguja; and for bendiocarb and deltamenthrin in Pemba (Fig 18). In 2010, insecticide resistance monitoring in *An. gambiae s.l.* showed that *An. arabiensis* was fully susceptible to deltemethrin, pemethrin and bendiocarb in Anguja with mortalities ranging from 99-100% but showing 95% mortality to lambdacyhalothrin. In Pemba, the vector was susceptible to only bendiocarb and resistant to deltermethrin (80%), pemethrin (50%), and lambdacyhalothrin (49%).

Figure 18: Susceptibility status of An. gambiae s.l to insecticides in 2008.



Source ZMCP 2008

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Figure 19: Resistance to pyrethroids in Pemba, December 2010

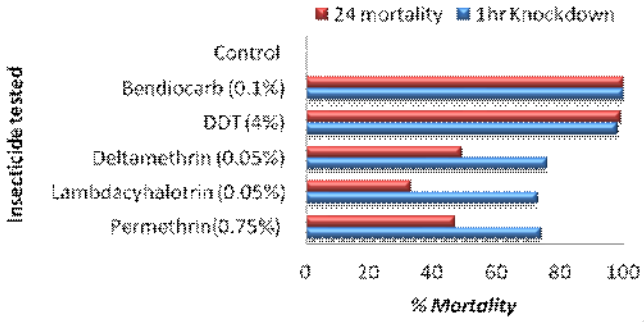
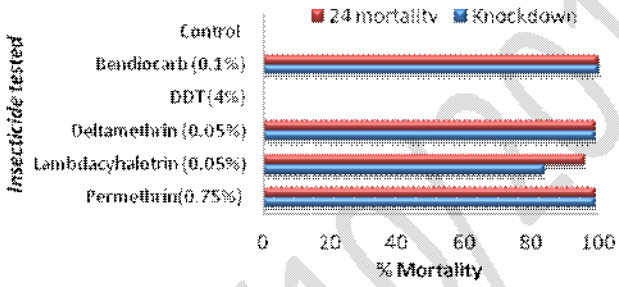


Figure 20: Results of insecticide resistance study Unguja June, 2010



Source ZMCP 2010

2.3.4.5 Bioassays

ZMCP introduced IRS in 2006-2008 using lambdacyhalothrin 10WP. In 2009 when lambdacyhalothrin 10CS was introduced. Monitoring of the residual efficacy of ICON® 10CS on different treated surfaces has been done using contact bioassays. The results for 2009's four- months post-spraying gave satisfactory results with mortality ranging from 85% to 100% on different surfaces

2.3.4.6 Indoor residual spraying

In Zanzibar IRS started in 1958 as a Malaria Vector Eradication Program using Dieldrin and DDT. In 1961, GOZ in collaboration with WHO started malaria eradication program using IRS with DDT, larviciding and chemoprophylaxis. This program failed to eradicate malaria in both islands but reduced prevalence rates to 7.8% in Unguja and 1.7% in Pemba.

A second major attempt to control malaria in Zanzibar using IRS was from 1983 to 1989 by ZMCP supported by USAID. Two IRS rounds per year with DDT in Unguja and malathion in Pemba were implemented. Population resistance to malathion was encountered and the project did not achieve much.

The third attempt of malaria control using IRS in Zanzibar was launched in 2006 with PMI support. So far a total of 6 rounds of IRS have been implemented with high coverage of above 85%. Before the first round of IRS commenced in 2006 entomological baseline data was collected. The first 3 rounds used 10WP lambda-cyhalothrin that was replaced with micro-encapsulated 10CS lambda-cyhalothrin from round 4

IRS processes and safety

The WHO safety standards and procedures for the handling, storage, transportation and use of pesticides are followed to minimize the risk of human and environmental exposure. Spray operators

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are trained to follow SOPs and to use Personal Protective Equipment (PPE). Adequate transport is provided to transport spray operators to and from the sites of operation. Supervision by team leaders and district and national supervisors is provided consistently and routinely using supervisory checklists. Disposal of all wastes is done according to WHO.

2.3.4.7 Long lasting Insecticide Nets

In 1990, Zanzibar initiated the promotion of subsidized ITN through ZJNSP. The nets were sold at amount of Tsh 800 (less than a dollar USD) per net targeting children <5 years of age with the aim of preventing under fives against malaria. In 1998 the ZMCP received ITNs from UNICEF and WHO which were distributed in 17 Shehia in both Unguja and Pemba at prices ranging from Tshs 3000 to 3800 each (less than 4USD).

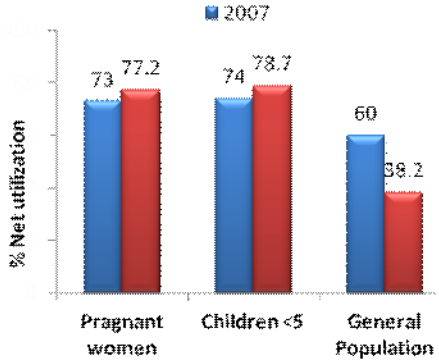
In 2002, coverage of ITN was 28.3% of general population who slept under untreated nets and 3% under ITN. The proportion of pregnant women sleeping under ITN was 2.9% and no children <5 slept under a net. The 2007 a house hold survey revealed that the use of ITNs in the general population increased from 20% in 2004 to 60% in 2007, the proportion of pregnant women sleeping under ITNs increased from 18.3 in 2004 to 73% in 2007 and of children <5 increased from 23.8% in 2004 to 74% in 2007. The nets re-treatment rate was 72% in 2007 from 43% in 2005.

ITNs distribution mechanism

The distribution mechanism for ITNs involves registration of household at Shehia level by community leadership supported by DHMT to determine the number of nets required. Community sensitization on ITNs for malaria prevention is done by health promotion unit of Ministry of Health, DHMTs and community health committees while distribution of ITNs is the role of community leaders (Shehias) under the supervision of DHMTs and ZMCP. The frequency of ITNs/LLINs distribution depends upon the availability of nets within ZMCP. In 2010, the distribution of LLINs was done in 13 out of 45 Shehias of the Urban district and a total of 31,875 LLINs were distributed.

The 2007 Malaria Indicator Survey showed that the use of ITN/LLINs was 60% for general population, 74% for children under five and 73% for pregnant woman as shown in fig 23 below. The 2010 MIS showed that the overall net utilization of any type for the whole population was 65%, while the proportion for those who slept under ITNs was 54%. Proportion of children who slept under any net was 87% and of those who slept under ITNs/LLINs was 79%. The overall use of any net among the pregnant women was 80% and 74% slept under an ITN/LLIN the previous night. Although Zanzibar achieved the RBM ITNs targets among pregnant women and children under 5 years of age, the country has not achieved universal coverage.

Figure 21: Net utilization in Zanzibar 2010



Source MIS 2007/2010

2.3.4.8 Larval source management

Larviciding was commonly used in Zanzibar during the eradication era in-1960s. In 1985,the same intervention were applied by using diesel and used motor oils to treat mosquito breeding sites. In 1996, some trials with *Bacillus thurigiensis israelensis* were carried

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out with good results. Currently, there are no larviciding activities in the country to complement IRS and LLINs. Space spraying and environmental management have been carried out in Stone Town.

2.3.5 Successes, best practices and facilitating factors

i. The program achieved universal coverage with IRS in 10 districts since 2006, 2 LLINs per household in 2008 and RBM targets for LLIN use among children <5 years and pregnant women (80% in 2010).
ii. The Vector control unit has skilled human resource at national level
iii. There are technical guidelines and training manuals for IRS and LLIN campaigns
iv. A network of community based organizations (CORPS), NGOs and CBOs for IRS and ITNs campaigns exists.
v. The program collaborates with reference laboratories and institutions such as IHI, NIMR, LSTM, CHS, UDSM
vi. There is a system of vector surveillance at sentinel sites supported by a laboratory and an insectary
vii. There is a routine delivery of LLINs to pregnant women in ANC There are a free supply of nets to all district hospital inpatients
viii. The program conducts monthly bioassays to monitor quality of spraying and residual efficacy
ix. The implementation of IRS and LLINs reduced sporozoite rate in local vector from 2% in 2005 to 0.2% by 2008 in Pemba and from 4.3% to 0% in Unguja and to 0% by 2009 at seven sentinel sites
x. The implementation of IRS and LLINs reduced *An. gambiae ss* and *An. funestus* to undetected levels leaving *An. arabiensis* as the major (primary) vector in both Islands.

SWOT Analysis

Malaria vector control

STRENGTHS	WEAKNESSES
a. Functional vector control unit within ZMCP b. National Health Policy & Strategy in place Good quantity and quality of ZMCP team c. Strong political commitment d. Strong VC partnership e. Adequate entomology lab, insectary & sentinel sites f. Malaria guidelines for universal coverage g. CORPs, NGOs and CBOs for IRS and LLINs campaigns h. Increased resource base for vectors control	a. Lack of a vector distribution map b. No systematic plan for LLINs distribution c. Stock out of LLINs in ANC clinics d. No implementation of LSM e. Little GoZ investment into vector control f. Outdated vector control guidelines g. Definition of universal coverage ~~g~~ h. No clear strategies for focalized vector control
OPPORTUNITIES	**THREATS**
a. Strong leadership and partnership for VC b. Community Health Services Policy supporting community participation c. Global donor support for IRS &LLINs d. Increasing population demand for LLINs e. High community awareness f. Availability of multiple channels for BCC	a. Delay in replacing LLINs b. Gaps in total required resources for meeting UC c. Development of insecticide resistance d. Donor driven programs

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2.3.6 Key issues

- The ZMCP continues to apply blanket application of anti-vector measures in the environment of malaria focal transmission

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- Vector control capacity at district level to implement malaria elimination program is non-existent.
- National guidelines for malaria vector control are outdated and not consistent with elimination agenda.
- There is no clear plan for sustained and timely financing and delivery of the vector control program to maintain the gains in coverage.
- The definition of universal coverage of 2 LLINs per household is not consistent with WHO definition
- There are no maps on the distribution of malaria vectors to guide targeted application of interventions
- Larval source management is not implemented to compliment IRS and LLINs
- Conventional nets continue to circulate among the population and to be sold in the market
- There are occasional LLINs stock-outs in ANC and conventional nets for inpatients are used.

2.3.7 Recommendations

- ZMCP to train district vector control teams to guide district vector control implementation towards elimination
- ZMCP to update malaria vector control policy guidelines to align them with the elimination program objectives
- The ZMCP definition of universal coverage should be consistent with the global definition of 1 LLIN per 2 persons or 1 LLIN per sleeping space.
- ZMCP should motivate for GOZ resources to allow for the sustained and timely financing and delivery of IRS and LLINs to sustain the gains in coverage.
- The ZMCP to stratify malaria zones into foci using epidemiology and entomology information and produce maps to guide focal IRS application
- The ZMCP ought to produce maps of the distribution of vector breeding sites to allow targeted Larval Source Management (LSM) where appropriate.
- The ZMCP should ensure that all health facilities and ANC clinics have enough stocks of LLINs for pregnant women
- The ZMCP must discourage the importation, sell and use of conventional nets and to supply LLINs for hospital beds.

2.4 Malaria diagnosis, and treatment; including malaria in pregnancy

1.1.1 Introduction

Plasmodium falciparum is the predominant malaria parasite. Based on household survey conducted in 2010, prevalence of malaria parasites was reduced to 0.07% compared to 14% of 2003. MoH introduced free Artemisinin based combination therapy to the total population from Chloroquine (CQ) in 2003. Malaria diagnosis using either microscopy or rapid diagnostic tests (RDTs) is recommended.

By 2007, all public health facilities were equipped with microscopes and/or RDTs. Quality assurance of malaria microscopy has been in place in all public and selected private facilities during the same period. Malaria in pregnancy is implemented through Safe Motherhood Initiative of Reproductive and Child Health Unit. Up to early 1990's malaria chemoprophylaxis for pregnant women using two tablets of chloroquine per week was implemented. This changed to intermittent preventive treatment (IPT) in 2004. At present no ACT resistance has been documented however the last antimalarial efficacy study conducted in 2004. ZMCP revised the diagnosis and treatment guidelines in 2010. In between 2007 and 2011, a total of 2,556 health workers were trained on diagnosis and treatment guidelines.

1.1.2 Policy and guidance

Malaria case management policy recommends parasitological confirmation prior to treatment. Prevention of malaria in pregnancy recommends the use of at least

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two doses SP as intermittent preventive treatmentin routine antenatal care.

1.1.3 Organization of case management services

Annual district comprehensive plans including malaria case management are developed in collaboration with DHMTs and health facility staff. These coasted plans are coordinated and implemented under the responsibility of the DMO. They include training, supportive supervision and supplies management. Quarterly review and planning meetings are held to provide feedback to the programme and to the health facility staff.

Malaria case management at community level

At community level, malaria case management is primarily being provided by the PHCU/PHCC. The MIS ibid, indicated increased community health care seeking behaviour from 36% of 2007 to 76% in 2010. Community health committees have been trained on malaria control to address issues relating to self medication, importance of prompt treatment seeking behaviour and effective referral.

1.1.4 Human resources, training and capacity development

The Case Management and Diagnostic Unit is divided into two sub units: Diagnostic and Treatment. These units are responsible for effective disease management, health workers capacity building and conducting operational research. The Unit is headed by a Physician assisted by Assistant Medical Officer. There is a clear link in malaria case management with District and Referral hospitals especially at Medical, Paediatric and Obstetrics and Gynaecology Department.

The units conduct series of training to the clinicians including Pharmacovigilance at district level and also in private sector.

1.1.5 Malaria Diagnosis

Parasitological diagnosis of malaria is made through rapid diagnostic tests at all levels of health care and microscopy in facilities with capability of microscopy. There is a reference laboratory at the ZMCP performing internal quality assurance for microscopy public health facilities and selected private health facilities. Currently, there is no external Quality Assurance scheme for microscopy.

1.1.6 Malaria prophylaxis

Malaria prophylaxis is not recommended for indigenous however, is much relevant to the visitors coming from non endemic countries.

1.1.7 Performance indicators and targets

The indicators for malaria diagnosis and treatment are available in Annex 7.

In 2010: 79% of the under 5 slept in the ITNs while 74% of the pregnant women slept in the ITNs.

1.1.8 Successes, best practices and facilitating factors

Successes and facilitating factors

i. Revision of policy and guidelines for malaria diagnosis and treatment in line with the current malaria epidemiological status

ii. Refresher training on case management and malaria in pregnancy are conducted as planned on annual basis to keep the health workers in both public and private sector updated on current malaria issues. This is coupled with regular supportive supervision on quarterly basis to ensure optimal quality of care.

iii. Due to reduced number of malaria cases, ZMCP plans to increase the number of malaria sentinel surveillance sites from 7 to 20 as part of strengthening surveillance.

iv. In collaboration with ZFDB, pharmacovigilance system is functional

v. Antimalarial drugs efficacy and safety are monitored in collaboration with together with research partners

vi. Pregnant women attending ANC are given IPT 1 and 2

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vii. Pre-referral treatment is provided to all severe malarial cases at PHCU

Best practices

i. Internal quality control and quality assurance for malaria microscopy and RDTs program are in place. Health workers at PHCUs have been trained to perform RDTs for malaria confirmation.

ii. Malaria advocacy in case management and malaria in pregnancy has been intensified and is carried out at various levels.

iii. Screening all pregnant women with RDTs ensures that sub clinical malaria infections are detected and treated to eliminate placental infections as thus work as IPT. This poses the question of whether SP should still be administered during pregnancy. I know there is an ongoing study on placental parasitaemia. The results of which will inform IPTp policy.

iv. 100% parasitological diagnosis, thus ensuring that only positive malaria cases are counted. This is coupled with use of RDTs during off-peak period such as weekends and evenings.

v. Piloting of active case detection is already an accepted paradigm shift from passive case detection. This has laid down the platform where national scale of this intervention can be achieved.

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SWOT Analysis

Malaria diagnosis, and treatment; including malaria in pregnancy

STRENGTHS	WEAKNESSES
a. There are national policy and guidelines on: malaria diagnosis and treatment; laboratory visual aids and coloured atlases for malaria species identification; draft malaria microscopy quality assurance guideline; procurement and supply management plan; reproductive health policy on malaria in pregnancy and IEC/BCC materials on case management. b. All malaria cases are diagnosed parasitological either with RDTs or microscopy. c. There is a core case management training team. d. Supportive supervision and follow up are conducted. e. There is good adherence on malaria diagnostic policy and guidelines in public health care facilities. f. Pregnant women are screened for malaria as part of ANC routine services whereby IPT is also provided. g. There is a functional national pharmacovigilance system within ZFDB.	a. There are no updated training modules and curriculum or targets set for training. b. Trainers do not have teaching methodology skills. c. ZMCP provides large amount of Giemsa stain (stock solution) to PHCUs contrary to the required amount. d. There is no external quality assurance scheme. e. Weak laboratory capacity: non identification of plasmodium species e.f. here is limited capacity (storage facility) to Central Medical Store for pharmaceuticals and other health products. ~~f.~~g. ack of proper quantification of malaria commodities g.h. There is no functioning national malaria case management committee. ~~h.~~i. Stock out of antimalarials was observed during the review period
OPPORTUNITIES	**THREATS**
a. Availability of funds to support case management and malaria in pregnancy activities. b. Strong political will and commitment from the Government. c. Accessibility of supportive staff with mixed skills. d. To discontinue SP for IPT. e. Availability of strong surveillance system for active case detection. f. ~~Low malaria incidence will lead to~~ malaria elimination.	a. Most of the funds for malaria activities depend on development partners including limited number of development partners to support the programme. b. Community perception on current low malaria situation reduces demand for services and commodities. c. Irregular flow of funds from MoH. d. Use of monotherapy for malaria case management particularly in private health facilities may lead ot ACT resistance. e. Some health care practitioners do not accept malaria laboratory results thus prescribe antimalarials. f. Low malaria incidence may lead to partners withdrawing their support.

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1.1.9 Issues and challenges

- Lack of malaria focal point in the districts
- No training targets
- Artemisinin monotherapies still available in private sector
- Private sector clinicians treat individuals as malaria case in spite of negative results

1.1.10 Recommendations

- ZMCP should advocate and promote adherence to treatment guidelines to health care service providers
- ZMCP to establish external quality assurance for microscopy and RDTs
- ZMCP should provide clinical algorithms for fever management
- Focal points for case management at district level to be appointed
- ZMCP in collaboration with ZFDB should ban the importation of ACT artemisinin monotherapies and other non recommended treatments for malaria
- ZFDB in collaboration with Pharmacovigilance Unit should strengthen monitoring of adverse drug reactions including ACTs
- ZFDB should strengthen monitoring system of counterfeits ACTs
- ZMCP should provide guidance on the use of SP for IPTp in low prevalence setting like Zanzibar.

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2.5 Advocacy, Information, Education, Communication and Community Mobilization

1.1.1 Introduction

Advocacy, Information, Education, Communication and Community Mobilization is an important supportive strategy in achieving the success of malaria control in Zanzibar through increasing uptake of prompt treatment with effective medicines, confirmed diagnosis of all fever cases, uptake of IPTp, ensuring the consistent use of LLINs and universal acceptance of IRS. Through advocacy, local communities and the Government of Zanzibar are committed to eliminating malaria in the islands.

1.1.2 Policy and Guidance

The Zanzibar Malaria Strategic Plan (2008 - 2012) defines ACSM as a key supporting intervention for the achievements of set targets and outcomes. The strategic plan was the basis for the development of the Communication Strategy for Malaria Control (2008-2012). The communication strategy is a guiding tool for implementation of ACSM activities at all levels. The Strategy was developed to adequately cover all four key malaria interventions areas namely case management, prevention of malaria in pregnancy, vector management and surveillance monitoring and evaluation.

The communication strategy was designed specifically to identify and use a wide range of communication channels to deliver messages and influence behaviour change. The most common channels used are mass media (radio, television and newspapers), IEC/BCC print materials (leaflets, posters and billboards), interpersonal communication (community meeting, counselling and dialogue) and participation in national and international event (World Malaria Day and Village Health Day). The communication strategy comes to an end in 2012 and did not undergo a midterm review in 2010 as planned.

1.1.3 Organization

The IEC/BCC unit within the ZMCP was set up in 2005 to support uptake of interventions implemented through Global Fund Round 4. The unit is headed by a focal point person supported by programme officers. The team works closely with all intervention units to design appropriate malaria messages.

1.1.4 Service Delivery outputs and outcomes

ACSM support for prevention of malaria in the community includes acceptance of indoor residual house spraying, mosquito net utilization, community mobilization through CORPS, Community health Committees and Environmental cleanness. There is high level of acceptance and use of malaria intervention manifested in the use of LLNs/ITNs, treatment seeking within 24 hours, uptake of IPT, and uptake of IRS. The use of ITN/LLINs was noted to increase from 73% in 2007 to 80% in 2010, 74% in the year 2007 to 79% in 2010 for pregnant women and children under five years of age respectively. Currently, nets are supplied to the community free of charge. The free distribution of nets has doubled the coverage with ITNs from 2.8% in 2002, to 26% in 2005 and to 60% in 2007 to 65% in 2010. The net use is attributed to strong advocacy and social mobilization supported by funding from the GFATM, PMI and the Government through political leadership.The LLIN coverage is currently less than 80% and the available LLINs in the communities were distributed three years ago indicating a need to redistribute

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new nets. There is a challenge with disposal of the old used nets which are discarded, burnt, or used for different purposes like fencing kitchen gardens, poultry farms and fishing.

IRS coverage decreased slightly from 95.4% in 2007 to 93% in 2010. The use of Intermittent Preventive Treatment (IPT) the data shows the considerably decreased from 57% in 2007 to 50% in 2010. The inconsistency of the data give an impression that prevention of malaria in community faces some inadequacies which also acknowledged by the available documents.

1.1.5 Knowledge, Attitude and Practice on Malaria

There is a decrease in appropriate health seeking behaviour among community from 55.6% in 2007 to 28% in 2010 while the level of awareness on the signs and symptom for severe malaria among community member has increased from about 53% in 2007 to 68% 2010. The proportion of children under five year receiving prompt (within 24 hours) diagnosis and treatment for febrile illness increased from 40% in 2007 to 70% in 2010. There are still some negative perceptions and misconceptions around malaria in Zanzibar that need to be addressed through appropriate channels of BCC.

1.1.6 Advocacy

The Revolutionary Government of Zanzibar has demonstrated commitment to malaria control through undertaking a considerable number of advocacy interventions including; support for the development of the Zanzibar Communication Strategy for Malaria control (2008-2012). This document is used to guide implementation of malaria control covering all key interventions. Key stakeholders, donor agencies, Key Ministries Civil Society and Community at all level. The major limitation of the Strategy is that once developed, it was not disseminated widely to stakeholders so as to effectively adopt it for their operations. The strategy has not been reviewed as scheduled after 2 years. The revision of the strategy was a prerequisite since Malaria intervention have a tendency of changing from time to time.

Commemoration of World Malaria Days was successfully implemented from 2005 when it was Africa Malaria Day. Since 2010, DHMTs are financially supported by ZMCP to commemorate WMD at District and Shehia level. Major activities undertaken during the days are; launching of village health day which comprises of environment cleanliness, destroying of malaria vectors, campaign on the use of nets, blood screening to check malaria, sensitizations of communities on malaria through trainings, meetings and theatre art performances. Limited participation of partners in WMD results in inadequate coverage of community activities. Strong mobilization efforts are needed to attract more donors to effectively contribute to the commemoration of the day as the occasion is very important in increasing community awareness towards the effective control of the malaria in the Zanzibar.

1.1.7 Research activities on ACSM

Although the ZMCP collaborates with research institutions such as IHI, PHL-IdC and NIMR, limited research has been carried out on the area of social sciences and quality assurance on ACSM with regards to malaria in Zanzibar. Rapid needs assessment of IEC/BCC in Zanzibar was conducted 2009.

Priorities for the ACSM unit are:

- Review of Zanzibar Communication Strategy for Malaria Control (2008-2012).
- Study on Knowledge Attitude and Practice on Malaria

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SWOT Analysis

Advocacy, Information, Education, Communication and Community Mobilization

STRENGTHS	WEAKNESSES
a. Presence of functioning IEC/BCC Unit within ZMCP b. Availability of of Zanzibar Communication Strategy for Malaria Control (2008-2012). c. Updated Community Guidelines for Malaria Control in place. d. Presence of Health Committees at Shehia level e. Linkage with NGOs, Health Promotion Unit and partners	a. No M&E Framework for ACSM activities b. Some patients reluctant to comply with the new malaria treatment regime. c. Inconsistency of position of ACSM. In some documents is mentioned as key intervention area while in some cases is stated as a supportive strategy. d. Difficulties to measure some of ACSM activities especially radio and TV programs. e. IEC/BCC materials for Malaria were mostly seen at the health facilities and not in other places (RAP Report 2009). f. Zanzibar Malaria achievements not well publicized outside Zanzibar. g. Reluctances of some Doctors especially in Private sector to use standardize malaria treatment guidelines
OPPORTUNITIES	**THREATS**
a. Place of Malaria Control and elimination in the national and international development agenda. b. Malaria being a health Sector Priority. c. Effective use of Malaria website. d. Existing of strong programmes which can work with ZMCP e.g. RCH ZFDB. e. Malaria program at school to be supported by UNICEF	a. Greater awareness of community consequently, High demand and expectation of communities b. Shortage of Skilled manpower in the area of ACSM. c. Limited funding from the current Budget of the MoH. ZMCP receive only 5 % (PER 2010). d. Existence of misconception, attitudes on malaria dynamics.. e. Lack of malaria champion in the country.

1.1.8 Successes, best practices and facilitating factors

1. The involvement of communities in development, planning and implementation of malaria advocacy activities through the Shehia Health Custodian Committees has been successful in increasing uptake of interventions and is one of the best practices from the ZMCP.

2. Highest level political commitment to malaria control and elimination, and to attainment of the MDGs

3. World Malaria Days have been commemorated nationally since 2005 and at Shehia level from 2010. World malaria day is used as a community advocacy event.

4. The development, production and dissemination of malaria advocacy posters and brochures, job aids and wall charts.

5. Successful launch of the affordable medicines for malaria (AMFm) subsidy for private sector ACTs. Involvement of NGO's CBOs, Shehias and community in implementation activities

6. Achieving global targets for malaria control:LLIN use among pregnant women 80%) and young children (79 %) in 2010, Access to prompt diagnosis and treatment for fever in young children is

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70%. Community knowledge of signs and symptoms of severe malaria was 68% in 2010.

1.1.9 Conclusion and recommendations

Advocacy, communication and social mobilization is an important supportive tool that facilitates the smooth running of implementation of malaria interventions. The ACSM unit has successfully incorporated all levels of society in implementation of activities. The main focus of ACSM interventions are prompt treatment seeking behaviour, increasing coverage and use of LLINs, uptake of IPT and IRS and the use of World Malaria Day for community advocacy. The following recommendations were made.

1. Establish and operationalize Zanzibar Malaria Coordinating Committee to coordinate all ACSM activities as per Zanzibar Malaria Control Strategic Plan (2008 – 2012)
2. ZMCP should review communication strategy for malaria control taking into consideration individual projects and units activities.
3. Upgrade the ACSM to a full unit within the ZMCP and increase the human resource capacity
4. Mobilize resources to ensure IEC/BCC activities are carried out continuously in order to achieve desired outcomes. In tandem with this operational costs for IEC/BCC should be increased from the current 4.4% to 8.8% by 2012
5. ZMCP should coontinue implementing community based i activities in line with national community health strategy designate appropriate malaria champions or role models for communities in Zanzibar.

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2.6 Surveillance, Monitoring and Evaluation

1.1.1 Introduction

ZMCP through the Zanzibar malaria strategic plan 2008-2012 is maintaining high coverage of a combination of effective interventions and establishing a system of surveillance to early detect malaria resurgence and to respond effectively. One of the specific objectives is to provide effective epidemic preparedness and response, by ensuring that more than 90% of health facilities report timely.

The MoH has the overall health information system to support the national health system monitoring and evaluation. In 2008, the ZMCP has reinforced the system of disease surveillance, program monitoring and evaluation which feeds to the National health information system.

1.1.2 Policy

The MoH policy (2010) put emphasis on harmonization of HIMS and overall HIS. An integrated HIS shall ensure availability of quality health and related information for evidence base on decision making. Programs shall harmonize their information needs and tools to the national health information policy guidance to a coordinated health system.

The above statement has been translated in the current ZMCP strategic plan where its broad objective is to establish a system of maintaining high coverage for effective interventions and establishing a system of surveillance to early detect malaria resurgence and to respond:

Two specific objectives are described below

- To provide effective epidemic preparedness and response, by ensuring that for > 90% of health facilities, reports are on time, investigation of reported epidemics is initiated within 24 hours and supplies are at hand to mount a response if necessary
- To assess the potential for sustainable elimination of malaria from Zanzibar, using newly available data from surveillance and operational research, as well as experience from implementation

1.1.3 Guidance

The ZMCP developed some guidance for effective malaria surveillance. These are rapid response guide to national and district health workers. Operational tools for reporting have also been developed. These include, malaria registers distributed to all PHC Units and Centers and Malaria early epidemic detection system and its operational guidance in reporting through cell phone reporting.

1.1.4 Governance, coordination & partnerships

The ZMCP has a designated Surveillance Monitoring and Evaluation Unit SME unit which is the hub for ensuring quality data within the Programme. This unit has strong link and collaborate with other units within and outside the programme. Other collaborating partners include RTI, IHI, ZAMRUKI, USAID and CDC. There is no SME technical working group to advice and coordinate support in this core area. However, the Unit has a link with other government ministries such as Meteorology Agency, Directorate of Urban Land Planning and Office of Chief Government Statisticians.

The SME unit of ZMCP is involved in early stages of planning and implementation of all malaria related surveys and researches (DHS, THMIS,) conducted in the country. Additional technical expertise and support from SME to these institutes is requested where ever is needed.

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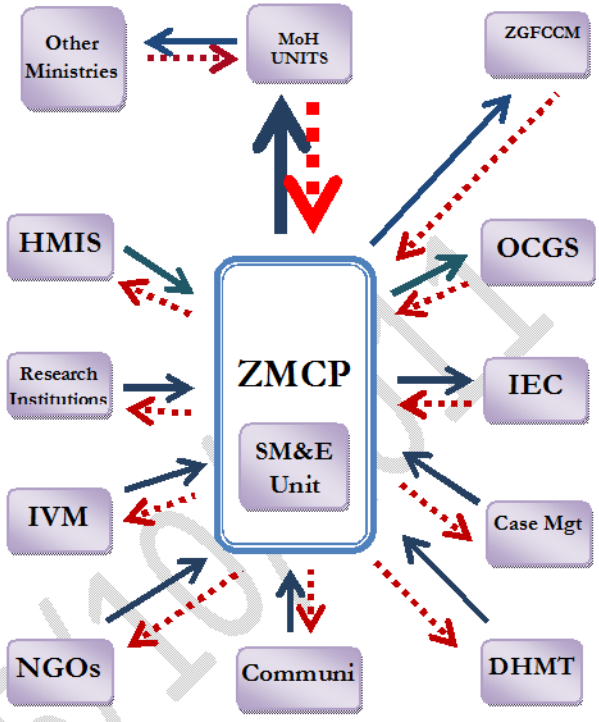
1.1.1 Organization structure for flow of information through ZMCP

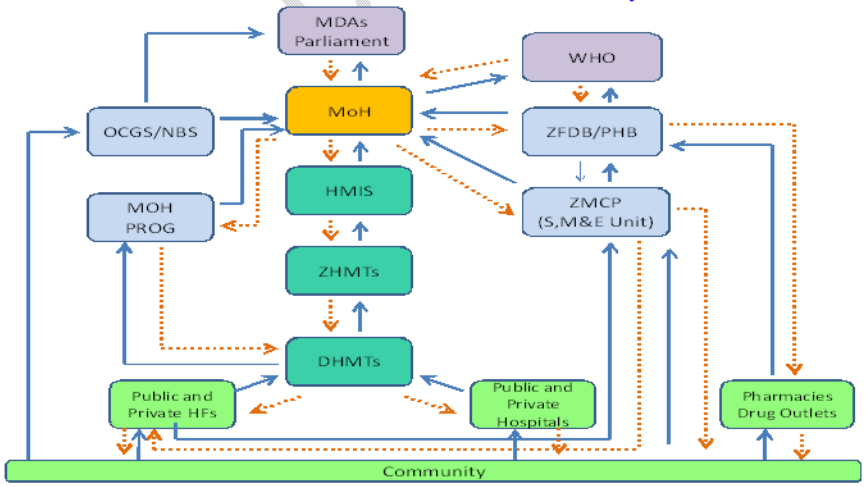
Figure 22: SME Coordination mechanism with other stakeholders

Information flow in the ZMCP starts from the community to the high level of the organization and ends to the MoH before the information is disseminated to other external stakeholders Figure.22 .



Source: ZMCP M&E Plan 2010

Figure 23: Zanzibar Health flow of information from the community to the MoH



The ZMCP in collaboration with HMIS staff compile data from selected sentinel hospitals using data collection tools which capture vital parameters for monitoring from and gives understanding of the malaria case at OPD and IPD, including malaria related deaths suspected and confirmed cases are also documented. Cell phone technology is also used in the surveillance of weekly report. This system is implemented

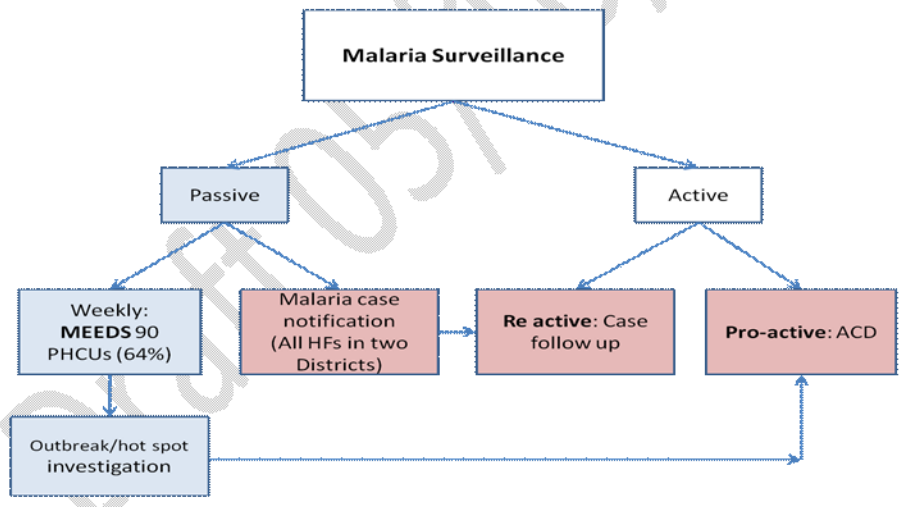
in 65% of all public health facilities, which will cover 100% of public health facilities by 2012.

1.1.2 Human Resources, Training and Capacity Development

The Unit is composed of five staff led by the Head and a deputy. One staff is assigned as focal person to follow-up and coordinates MEEDS implementation activities. The SME Unit lack adequate capacity in terms of number of staffing required. For instance, lack ME specialist, statistician, in the Unit hampers its smooth implementation of ME activities, however the current members have been oriented on ME concepts and skills in this important strategy. At district level (sentinel sites) data collectors have been trained on data management for better collection and reporting.

Surveillance as part of the unit is responsible dealing with reporting of weekly and monthly trends of disease. The malaria surveillance includes passive and active monitoring components. The former is implemented through the MEED System in 90 selected public and private facilities, coordinated by focal person, while the latter, is expected to be implemented through a follow up of individual case based notification using the local health facilities at district level with support from DHMTs and Shehia leadership. The active case follow up maximizes the possibility of capturing more asymptomatic cases at the community level. Detailed explanatory is shown on Figure 24.

Figure 24: The model for Malaria Surveillance and Response in Zanzibar



The M&E section within the SME unit provides the overall support for the ZMCP program monitoring and evaluation coordination. This involves support for annual or bi-annual community/household and health facility surveys on outcomes. This also involves routine program monitoring regards outputs and operational outcomes from various interventions. SME also supports the training and supervision within District and Shehia levels.

Malaria Epidemic Preparedness and Response - has become an important section for the program to address the annual seasonal increase of malaria cases. During high transmission season a proactive approach to address malaria hotspots reported by the MEED system. This unit

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has no focal point to monitor and supervise disease trends and forecast outbreaks.

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1.1.3 Malaria case definitions

According to integrated disease surveillance (2010), standard case definitions for malaria, are defined as follows:-

- **Confirmed uncomplicated malaria:** Any person with fever or fever with headache, back pain, chills, sweats, myalgia, nausea and vomiting and have positive RDT or laboratory being confirmed microscopically the presence of malaria parasites or antigens.
- **Confirmed severe malaria:** A patient who requires hospitalization for symptoms and/or signs of severe malaria and receives anti-malarial treatment, and have mRDT or laboratory confirmed the presence of malaria parasite and in the presence of any life threatening condition.

1.1.4 M&E Plan, Indicators, Targets and Performance

The ZMCP developed Monitoring and Evaluation Plan 2008-2012 to track the implementation of the malaria strategic plan 2008-2012. Impact and outcome indicators see Annex 7, have been well outlined with standard name, definition, and source of information.

1.1.5 Malaria surveillance system

MEEDS system captures the following data: all cause attendance, confirmed malaria cases, negative cases aggregated in all age groups.

In early 2008 MEEDSs started with 10 PHC Units and expanded to 52 health facilities by end of 2009. In mid 2011, 90 have been enrolled from a total of 210 health facilities, public and private.. The implementation of this system was supported by training and production of bi-annual feedback meetings with the DHMT. Operational guidelines on malaria surveillance and response have been produced in 2010 to reinforce the system.

Table 10: Summary Zanzibar MEEDS Biannual Report, Mid - Year 2011

Indicator	Pemba[1]		Unguja[2]		All Zanzibar	
	2010	2011 Jan-Jun	2010	2011 Jan-Jun	2010	2011 Jan-Jun
No. all-cause visits	233,986	138,100	310,120	191,019	544,106	329,119
No. tested for malaria	57,408	35,891	81,915	70,696	139,323	106,587
Malaria testing rate (%)	24.5	26.0	26.4	37.0	25.6	32.4
No. confirmed malaria cases*	642	297	1,508	1,379	2,150	1,676
Malaria positivity rate (%)	1.1	0.8	1.8	2.0	1.5	1.6

[1] Pemba: a total of 41 PHCU since 2010
[2] Unguja: a total of 49 PHCUs since 2010
* 82% of reporting sites have diagnostic capacity for *Plasmodium falciparum* only

All fever cases seen at outpatients are screened with RDT or microscopy (depending on availability) for malaria. By the end of 2010 around 139,323 cases were screened for malaria, and by mid 2011, about 106,174 were also tested. Overall testing rate was around 25% and malaria test positivity rate remained steady around 1 to 2%. Number of malaria positive cases had tripled to 2150 cases at the end of 2010 and 1600 by mid-2011.

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1.1.6 Malaria case register

Malaria registers have been introduced to all Public health facilities.with the aim of reporting and documenting patient data which include full identification (address and details of recent travel history) **Results from the registers**

In 2008 to end of 2010 the results shows that malaria risk is mainly in the age group of 5-9, 10-14 and 15-19. In addition travel history was reported in 10-20% of the cases.

1.1.7 Active case based surveillance

In 2011, the ZMCP started piloting community based screening for active case detection in catchment areas of PHC reporting a high number of positive cases. One of the responses was to move out of health facility fever screening to track positive cases at household level and start active case detection.

The following PHCU catchment areas of Tumbe and Shumba Vyamboni in Pemba and Bumbwini Misufini, Upenja and Jendele in Unguja were identified as malaria hotspots based on analysis of three years data from the MEEDs system.

Comment [06]: Need more description of the active case based surveillance

Table 11: Active Case Detection ACD implementation in Unguja and Pemba

Shehia	Tests performed	Positive detected	Positive %
Shumba vyamboni (P)	908	112	12
Jendele (U)	2831	8	0.3
Cheju (U)	3102	36	1.2
Total	6841	156	14

Note: *U- Unguja and P-Pemba*

1.1.8 Hospital sentinel surveillance

In 2008, the ZMCP set up a sentinel sites to monitor disease trends (admissions, morbidity, mortality and its, associated causes) on a monthly basis. A total of three Cottage hospitals, 3 District hospitals and one referral hospital were enrolled. Information from OPD, IPD, laboratory, pharmacy and MCH are collected. Results are found in section one, table one, figure eight (malaria admission and deaths and BT).

1.1.9 Integrated Disease Surveillance system

The IDSR is a comprehensive strategy for improving communicable disease surveillance and response through integrated approach linking community, health facility, district and national levels.

The ZMCP is planning to move from the control stages to pre- or elimination based on the findings from different surveys and studies. In this regard, tracking of malaria confirmed cases (case-based surveillance) in all levels of health care provision is important. This could easily be done through the IDSR system of the Ministry of Health. IDSR guidelines are in place to support health care professionals in day to day operation. More over this surveillance system can be incorporated with infectious disease weekly ending report (IDWE)– which report epidemic prone diseases to the EDS Unit for appropriate and timely action.

1.1.10 Routine health management information system

Zanzibar Health Management Information System (HMIS) supports the overall monitoring and evaluation of the national health system. The system collects various monthly out-patient data including, malaria clinical and positive cases aggregated by age groups. Data are stratified by health facilities, districts and zones.

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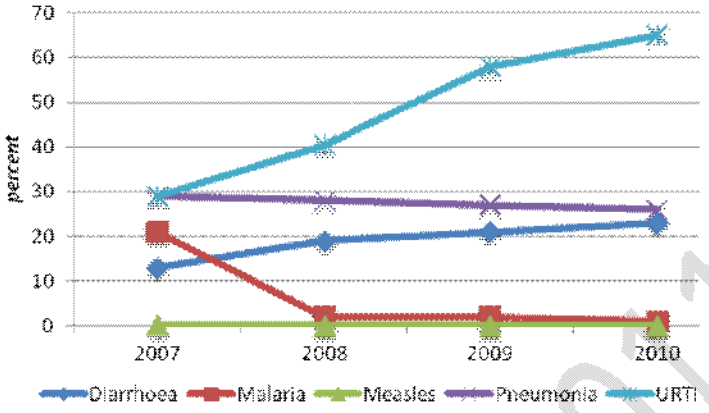
The proportions of clinical and confirmed malaria continue to decline as shown in the figure 25 below.

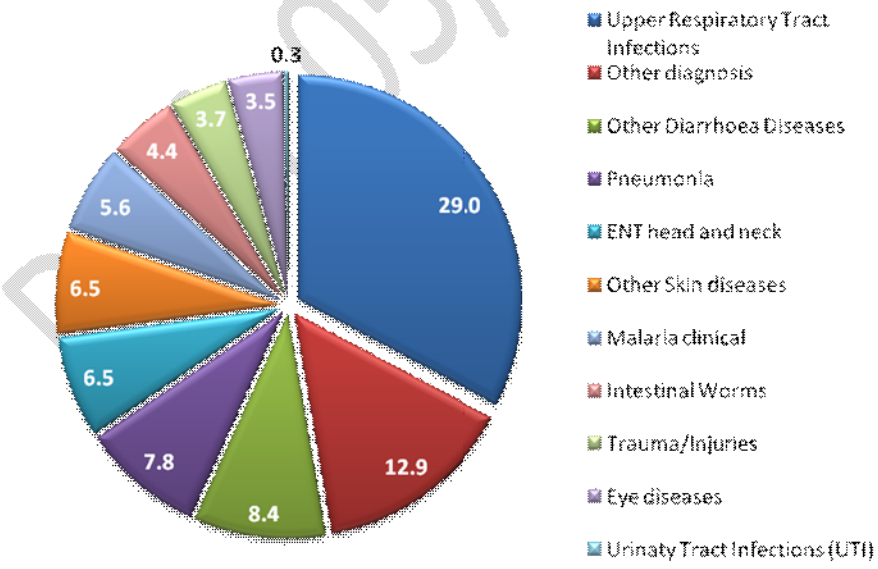
Figure 25: Malaria outpatient attendance versus other child hood diseases 2007-2010



Source: Zanzibar HMIS records, 2010

In 2009, major emphasis was given on parasite based diagnosis. Malaria was found to be not among the top ten causes of hospital attendance, admission and deaths to both children and adults. Figure 26 HMIS produces an annual health bulletin where malaria indicators are presented as a stand alone section.

Figure 26: Malaria as a proportion of other outpatient attendance



Source: HMIS bulletin 2009

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1.1.11 Malaria commodities and logistics management system

There is no comprehensive malaria logistics information system to track the status, use and current levels of stock of malaria commodities. Vector control commodities are planned and distributed as part of planning and management of the annual IRS campaign and the periodic LLIN campaigns. And routine delivery of LLIN though ANC clinics. The RDT and ACT are procured and distributed through the central medical stores directly to all health facilities. A system for tracking of RDT use has been set up by ZMCP with a chart in each health unit on monthly use of RDT. This information is collected monthly by the HF supervisors and forwarded to ZMCP. This RDT tracking system could be expanded to include ACT and routine LLIN distribution through ANC and monitoring of utilization and end of month stock levels. This could evolve to become a monthly malaria information system from all health facilities to be submitted to the district health information officer and subsequently to the ZMCP.

1.1.12 Malaria Surveys

The program has conducted comprehensive household malaria surveys in 2007 and 2010. Both included assessment of malaria prevalence and generated the community based outcome indicators for tracking the performance of the program. These national sample surveys have also been complimented by KAP surveys in 2003 and 2007 on the use of anti-malaria and utilization of LLINs. Cross sectional surveys are periodically carried out in two districts of Micheweni and North A since 2003.

1.1.13 Surveillance and program management reports

The ZMCP produces quarterly reports on progress in malaria control activities. The reports provide implementation status of the programme.. Challenges are highlighted in the reports. Semi-annual programme performance and disbursement reports are also produced.. Finally, annual programme reports are prepared and circulated to stakeholders and partners.

1.1.14 Progress in surveillance, monitoring and evaluation and research planning

Strategic activities indicated in the malaria strategic plan have been implemented as shown in the table 12, below;

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Table 12: Progress of SME planned activities, 2011

Planned 2008-2012	Progress-2011	Comments
1. Regular monitoring activities throughout a year	Weekly Monthly Annul disease monitoring	**Partially Achieved**
1. Existing of M&E tools for data collection, **2.** Timely flow of information on malaria morbidity and mortality from peripheral health facilities to the central level is on place throughout the year.	Weekly tool-MEEDS Monthly tool-HMIS Malaria register ACD recording	**Achieved**
3. Sentinel sites will continue to be used for monitoring drug resistance. Also more functional sentinel sites for monitoring insecticide resistance will be added. All studies are conducted according to the recommended protocols of WHO.	Drug sentinel sites Vector sentinel sites	**Achieved**
4. Population and health facility-based surveys are carried out in collaboration with partners. These include other departments and units in MoH as well as research institutions.	2007 RBM Survey 2010 MIS survey	**Achieved**
5. Efforts are made to conduct biennial Malaria Indicator Survey, where possible integrated with other related monitoring and evaluation surveys. (e.g. DHS, THM indicator survey, IMCI, Reproductive Health and EPI surveys).	2007 RBM Survey 2010 MIS survey Malaria is part of the 2010 DHSS	**Achieved**
6. Annual community cross-sectional survey will be performed throughout the implementation in the two sentinel districts.	Prevalence sentinel sites Epidemiological HF sentinel sites in hospitals	**Achieved**

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SWOT Analysis

Surveillance, Monitoring and Evaluation

STRENGTHS	WEAKNESSES
a. All fever cases are confirmed for malaria, documented and reported since 2009 . b. 1.Weekly malaria surveillance/ MEEDS system started in 2008 c. Maintained Sentinel surveillance for drug efficacy, insecticide resistance and entomological surveillance. d. Existence of monthly malaria hospital surveillance system e. Existence of malaria register in outpatient and laboratory f. 4.Established and functional monthly malaria information HMIS system g. Piloting Active case detection in malaria hotspots in 2011 h. SM&E Plan 2007-2012 in place i. Bi annual malaria community and household surveys conducted and report disseminated j. Malaria indicators are part of the demographic and health surveys k. Well established partnership and collaboration for research support for control. Karolinska (Case management and parasitology), Ifakara-LSTM (Entomology). l. Well established central surveillance cell in the ZMCP m. Good collaboration with HMIS and links with the district health information officers to support the malaria surveillance system n. Availability of technical and financial support from USAID, PMI , RTI and CDC. o. 12. Bi-annual surveillance report developed and circulated	a. Inadequate focus on confirmed malaria incidence and confirmed malaria cases as opposed to malaria positivity rate b. Inadequate timely response and investigation of confirmed cases and identification of hot spots c. Lack of spatial stratification of confirmed cases by Sheiha d. HF and DHMT not charting and using malaria interventions and access and coverage and disease trends data. e. Malaria intervention coverage and disease data not stratified by Shehia and district. f. Malaria outbreaks not well defined and thresholds not established and epidemic not tracked. g. Inadequate collection and analysis of malaria register data to identify risk factor for transmission. h. Weak program monitoring and evaluation.
OPPORTUNITIES	**THREATS**
a. Weekly mobile phone system can be rapidly change to case based surveillance system b. Policy of elimination and prevention of re-introduction can bring support for case based surveillance c. Strong political will and commitment from the government and development partners	a. Over Integration of malaria surveillance and information system with IDSR and HMIS

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1.1.15 Key issues

1. Surveillance system not integrated
2. Weak operational research framework
3. Efficacy testing widely spaced
4. Define threshold for action and rapid response
5. Epidemic Preparedness and Response focal point, plan and emergency malaria stock
6. Malaria interventions coverage and diseases data not stratified by shehia and district
7. Malaria outbreaks not well defined and threshold not well established and abnormal increases and epidemics not tracked
8. Inadequate collection and analysis of malaria register data to identify risk factor for transmission
9. Weak operational program monitoring and evaluation
10. Health facilities and DHMTs are not chatting using malaria interventions operational access, coverage and diseases trends data.

- To shift to individual malaria case based surveillance using (passive and active)(smart phones) and mobile phone system/point of sale.
- Weekly surveillance reports should focus on review of positive cases and transmission hot spots.
- There is need to establish a malaria profile at health facilities, districts and within ZMCP for tracking monthly and annual trends in access and coverage of interventions, disease trends and outbreaks.
- A district malaria surveillance officer/focal point should be appointed to work within the DHMT.
- Surveillance, monitoring and evaluation (SME) working group of partners and stake holder and a functional SME unit should be established in Pemba ZMCP Office
- The SM&E findings from routine surveillance and periodical surveys should be streamlined for improving planning and implementation at program level.
- The routine operational monitoring and evaluation of access and coverage should be strengthened to support strategic and programmatic decisions to be based on SM&E observations.
- A community based active malaria surveillance system should be established to conduct household pro-active case screening (febrile and non febrile) in selected Shehia (by using community surveillance workers/Shehia malaria focal persons within the established Shehia health custodian committees).
- There is need to develop a simple wall chart with practical malaria case definitions to be used by all health workers

1.1.16 Conclusion and recommendations

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2.7 Epidemic Preparedness and Response

1.1.1 Malaria epidemic risk

Eco-epidemiologically Zanzibar is considered to be a high perennial malaria transmission area with no risk of epidemics. Historically there are no records of occurrence of major epidemics even during the period of malaria eradication efforts in the 1960s and 1980s when transmission levels were brought down to unstable moderate and low seasonal transmission. Again when coverage of control declined following time limited eradication efforts malaria appears to have gradually resurged back to high perennial transmission without noticeable major epidemics.

In the last five years there is no association between average annual rainfall and annual malaria trends. Malaria has continued to decline steadily. However,, in each year there is a sharp increase in malaria associated with the long rains during the months of May to July.

This annual seasonal increase appears to be associated more with the patterns of annual rainfall and minimum and maximum temperature which favors a sudden increase in density of *An Arabiensis* for a limited period over a few weeks. With the current low and unstable malaria transmission one would expect low levels of immunity in the population and the risk of malaria epidemics becoming more and more a major threat especially when coverage of interventions decline.

Figure 27: Annual rainfall and malaria trends

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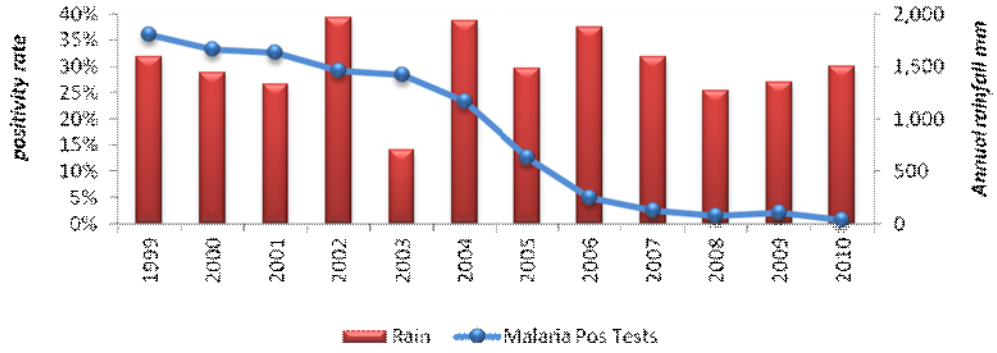
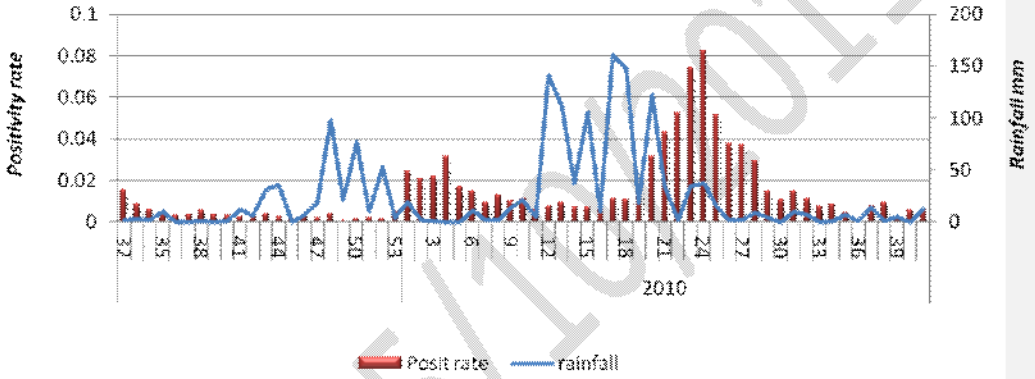


Source: ZMCP 2010

Figure 28: Annual rainfall and peak malaria transmission



Source: ZMCP 2010

Malaria risk in Zanzibar over the years has been taken to be uniform. Potentially high epidemic risk areas have not been defined, identified or mapped based either on historical records of occurrence of epidemics or using ecological risk factors. An ecological map of Zanzibar is not readily available. A number of malaria transmission hot spots have been identified since the start of intensive malaria surveillance with MEEDS in 2008. Currently a few seasonal hot spots are active in Central and Western Districts of Unguja and in Micheweni District in Pemba. Other previously identified hotspots are currently controlled (North B district in Unguja). The establishment of malaria surveillance allows a quite precise identification and monitoring of the intensity of transmission in the identified hotspots and is good guiding tool for both epidemic prevention and early warning for rapid response and containment (Figure.3**)**. A good proportion of hotspots are in the proximity of rice/paddy fields, however more epidemiological and entomological investigations are needed to clearly identify epidemic risk areas.

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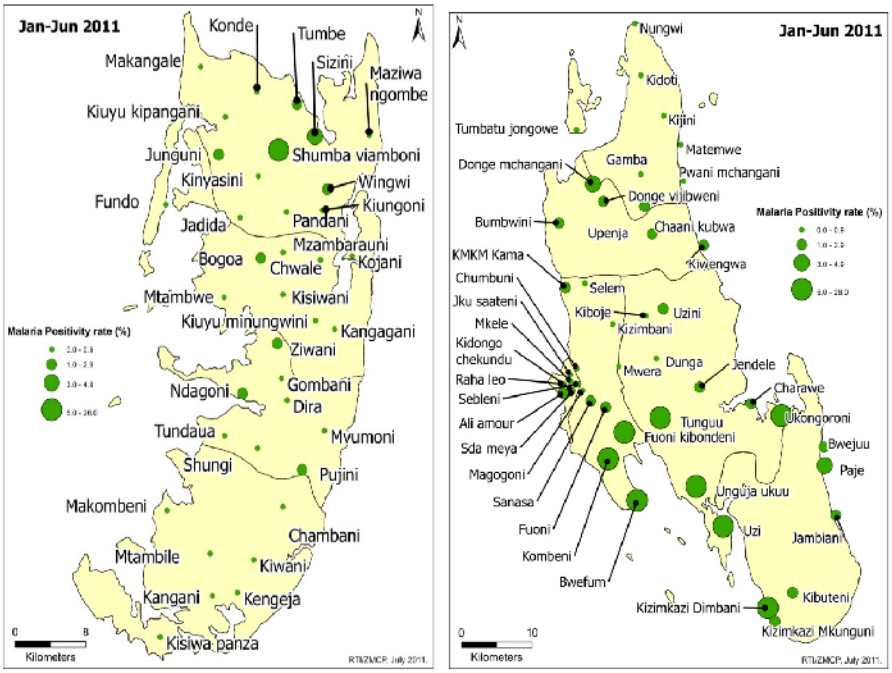
Figure 29: Malaria hotspots January -June 2011



Under the current low and seasonal malaria transmission, the vulnerability and risk of intensity of malaria transmission has shifted in Zanzibar from children U5 of age to older all age groups. In the period prior to effective malaria control (before 2005) the ratio between under fives and five years and above was approximately 1:1.

A number of recent observations are showing that the ratio is now 1:3, (Figure 5). Young adults are currently more affected then under fives.

1.1.2 Forecasting malaria epidemics

Tanzania Meteorological Agency is providing daily (2 weather stations) and monthly (10 weather stations), maximum and minimum temperatures and humidity and average rainfall data to ZMCP. This information only allows for retrospectively analysis of the association between weather and malaria trends. This collaboration could be strengthened further with the access to short term and medium term climate forecast to develop also short and medium term forecast of annual malaria risk.

1.1.3 Preventing malaria epidemics

Primary prevention of malaria transmission has been to scale up with LLINs combined with IRS universally in all areas of both Islands with universal access to ACT and RDT. In 2011 active case detection has been piloted in what is defined as malaria hot spots or high transmission foci to conduct community based screening to identify asymptomatic infection. Two screening exercise were conducted in the malaria hot spots at a 4 weeks interval. Two screening methods were used 1) population mobilized to come to community screening points and 2) house to house active case detections. In some Shehia asymptomatic parasite prevalence as high as 2.5% was detected. This community based ACD is proposed to be conducted in the future annually in all hot spots during the months of March and April before start of the rainy season and peak transmission. This proactive delivery of community based screening testing and treatment would continue to reduce the reservoir of infection and reduce malaria transmission and prevent the occurrence of epidemics. It may be considered that this

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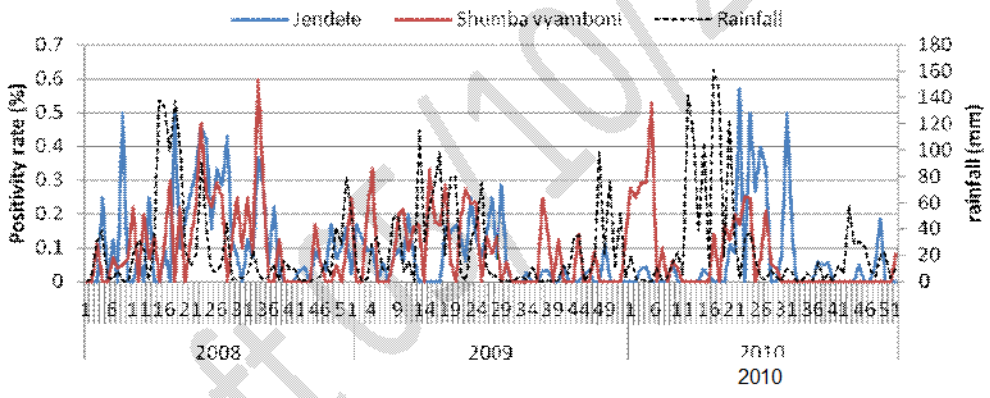
method of parasite control targeted at malaria foci be considered twice, first at the end of the peak malaria season in September-October and then followed again in March-April before the start of the next malaria season. As the number and seize of malaria foci decrease and shrink it may be important to consider strategies and techniques to eliminate the foci using advanced more highly sensitive diagnostic tests for screening of asymptomatic cases.

Table 13: Community base screening of malaria transmission foci

Shehia	No Tested	No. positive	Positivity Rate %
Jendele	1380	3	0.2
Chechu	1661	10	0.6
Chimba	1,122	11	0.98
Mhingoni	1062	28	2.6
Shumba vyamboni	1,051	25	2.4
Total	6276	77	1.20%

Figure 30: Malaria positivity cases in Jendele and Shumba vyamboni 2008-2010



Source: ZMCP-MEEDS

Table 16: Line listing of areas as malaria transmission foci, 2011

District / Site	Shehia	Primary Health care facility	Reasons for foci of transmission	In five days, No of cases	Positivity Rates
Central / Jendele	**Cheju**	**Cheju PHCU**	1. Rice fields with huge breeding sites around the areas.	**1,661**	**10 (0.6%)**
	Jendele	**Jendele PHCU**	2. Migrants from lots parts of Tanzania during cultivation period	**1,380**	**3 (0.2%)**
Micheweni / Shumba vyamboni	**Chimba**	Shumba vyamboni PHCU	1. Rice fields with various of breeding sites around the areas	**1,122**	**11 (0.9%)**
	Mihogni		2. Low coverage of LLINs and IRS compare with other places	**1,062**	**28 (2.6%)**
	Shumba vyamboni		3. Resting habit of young people mostly outside during late evening	**1,051**	**25 (2.4%)**

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1.1.4 Early warning and surveillance of malaria epidemics

Malaria Early Epidemic Detection system (MEEDS) is a weekly early warning system started in 2008 and has been progressively scaled up to cover 65 % of health facilities. Before the end of 2011 the system will be covering 100% of public health facilities and 4% of private health facilities. The service is active throughout the year and is using real time data communication (mobile phone), data management (centralized database) and data dissemination (web site). Weekly summary are developed by ZMCP and discussed in a weekly meeting. The Integrated disease surveillance system on epidemic prone disease in Zanzibar is currently being developed and should in the future include malaria as a notifiable disease. MEEDS and IDSR will compliment each other.

Currently, there are no specific epidemic thresholds in place. The thresholds should be calculated from 5 years retrospective data. It will take a few more years to get a useful set of data to calculate thresholds. It should be noted that the threshold system in an area like Zanzibar has several limitations; increase of cases is a seasonal event and is related to the timing and level of rainfall. If precipitations are starting or ending at different times compared with the previous year's values, an inaccurate threshold is set for that particular week. Other events is, changing epidemiology associated with coverage of interventions. E.g. North B district has been reporting high case load for two consecutive years and few cases in the following year. Even using very sensitive thresholds the level for the next year will be calculated by using values that may not be more representative for that area.

The absence of thresholds is not hampering the detection system. A weekly monitoring of actual cases and positivity rate by administrative district and health facility levels is currently provided through web site. SME officers monitor the malaria trends on weekly basis. If any health facility is reporting an increase of two folds the cases of the previous week is automatically flagged (red) in the weekly summary. Two consecutive weekly red flags are providing an alert to be investigated. At health facility level they can quickly respond to any abnormal increase of malaria cases, to report in the district which takes appropriate and timely action in collaboration with ZMCP. Community based screening, treatment and local vector control containment measures may be initiated.

This early warnings should ideally include entomological surveillance in a representative number of sentinel sites. The current numbers of sites are still insufficient to establish an effective entomological surveillance; this is due to the fact that there are a number of hotspots where entomological service is done just as hotspot surveys. The SME Unit is planning to monitor other early warning parameters such as: inbound population movements and effect of development projects.

1.1.5 Rapid Response to Malaria Epidemics

Rapid response to any abnormal increase in malaria are initiated centrally by the ZMCP in collaboration with the local DHMT and primary health care unit based on HF notification or weekly MEEDS reports. Epidemic assessment check list and tools are available. The first step is to confirm the reports of an abnormal increase by review of records in the catchment area primary health care facility followed by community based fever screening of four houses in all directions around the index cases with BCC, focal IRS and LLIN distribution.

Two local abnormal increases in malaria have been notified in 2011 from Uzi and Bumbwini villages. Outbreak investigation and response was conducted and reports have been prepared. There are plans to strengthen districts by establishing two district rapid response teams and gradually expand this to other districts. Training needs, curriculum, job aids are currently

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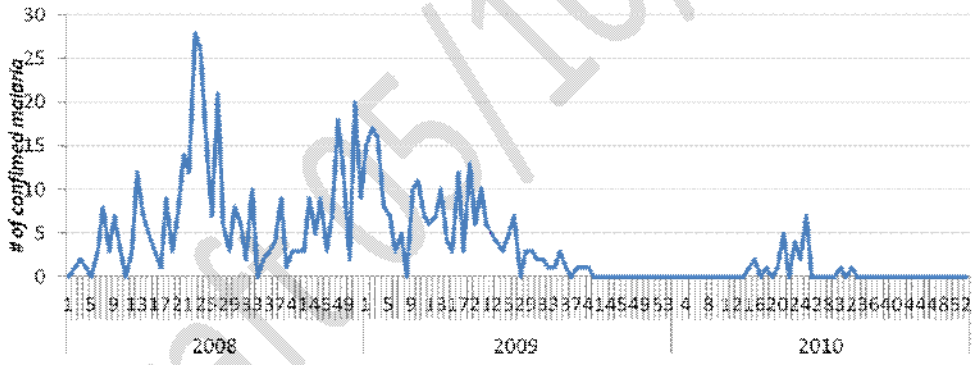
being prepared for the district capacity building process.

Active case detection through community based screening was initiated in 2010 in Central district at Uzi Island and has been deployed in three occasions during 2011, that is Micheweni district at Shumba, and Jendele, Cheju, Tunguu andUnguja Ukuu in 6 Shehias of Central district . A draft protocol is available and is adapted to the situation where active surveillance is needed. Due to the manageable size of intervention (health facility catchment area) during suspect of epidemic situation or abnormal increase of malaria cases, the preferred method of diagnosis is RDT. In all cases of rapid response there has been an alarming "emergency" level which required a national declaration and mobilization of last scale support for containment. All interventions were quite focalized in two-three Shehias and all responses based on ACD with parasitological diagnosis.

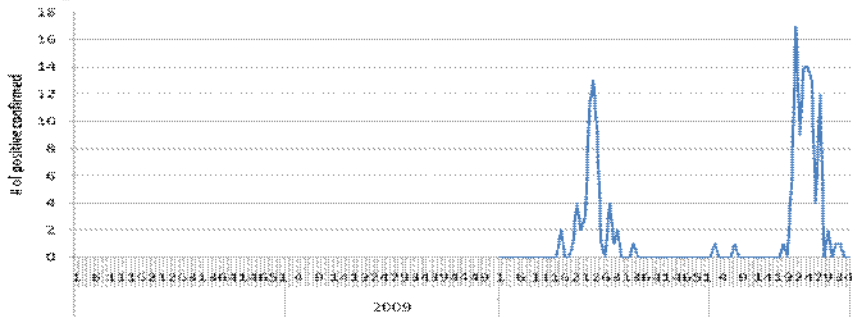
The current protocol is anticipating that in case of large epidemics, presumptive cases diagnosis is allowed by using clinical symptoms such as fever or history of fever but asymptomatic mass treatment has not been included. IRS as repeated focal spray and LLIN were delivered after investigations of abnormal increase of cases in 2008 in Bumbini. In 2010 LLIN were delivered in Uzi after an epidemic alert and in 2011 LLIN were delivered in Muyuni Shehia. It should be noted that after the focal spray and redistribution of nets in 2008 and 2009, it was observed that the number of malaria cases reported from Bumbwini area decreased dramatically. (Figure.32)

Figure 31: Confirmed malaria trends in Bumbini PHC



Source: ZNCP- MEEDS

Figure 32: Confirmed malaria trends in Unguja. Ukku PHC



Source: ZMCP- MEEDS 2009

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1.1.6 National Control Systems for Malaria Epidemics

The SM&E unit of the ZMCP in collaboration with other MoH departments and partners is responsible for organization and coordination of epidemic response. The unit is liaising with other ZMCP unit in implementation of response: entomological team, LLIN unit, IRS unit, MCM unit and BCC unit. A joint team with representative from the above units is conducting investigations and response; district response units are currently being formed to decentralize the response to community level.

In February 2011, the national guidelines for malaria surveillance and response have been developed; SOP is currently available for Active Case Detection and epidemic investigations. The Malaria Surveillance & Response guidelines promote the involvement of DHMT to provide investigation and response to epidemic alerts. The process to improve capacity for these bodies has started and will be completed for two districts by end of 2011. The capacity development includes the following steps:

- Assessment of skills and training needs and
- Development of capacity building curriculum and training materials, conduct training and follow up.

The BCC unit of ZMCP is involved in sensitization of communities once an epidemic alert is flagged out. Key messages in the prevention and control of malaria epidemics including the early care seeking and use of LLIN are advocated routinely once an alert is reported. Public meetings and house to house interpersonal communication is widely used.

Communities are involved in planning and implementing the response activities, whereby community leaders are fully involved in ACD by organizing screening stations or by providing escort to response team in the house to house visit. Materials and media are being used for disseminating information, education and communication about presence of abnormal increasing of malaria and emergencies, However, no media or printed packages have been developed so far specifically for malaria epidemics.

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SWOT Analysis

EPR Strengths, weakness, opportunities and threats

STRENGTHS	WEAKNESSES
a. Weekly malaria surveillance/ MEEDS system started since 2008 b. Link with metrological department and monthly access to daily and weekly rainfall, minimum and maximum temperature and humidity data from two sites c. Malaria transmission hot spots being identified d. Abnormal increase in malaria notified within one week and investigated and responded within one week e. Abnormal increase Investigation and response reports	a. Lack of a focal point for epidemics b. Lack of clear definition of epidemics/ outbreaks and resurgence c. Thresholds not well defined for outbreaks d. MEEDS covers only 65% of health facilities e. Malaria transmission hot spots and high transmission Shehias not mapped f. Lack of monthly tracking of abnormal increase/outbreaks in malaria g. No short-term and medium term forecasting for early warning of epidemics. h. Inadequate preparedness before annual malaria peak season. (May to July) i. Inadequate epidemic response teams at level of DHMT j. Lack of specific emergency stocks to support rapid response to epidemics.
OPPORTUNITIES	**THREATS**
a. Priority being to focus on malaria foci and hotspots b. Active case detection????	a. Complacency regards lack of epidemics b. Inability to sustain high coverage

Comment [07]: What does it mean?

1.1.7 9. Recommendations

1. ZMCP malaria surveillance and response guidelines should be operationalized.
2. MEEDS should be extended rapidly to cover more than 90 % of public health facilities
3. EPR focal point should be assigned within the ZMCP, supported with an EPR plan and emergency stocks.
4. Abnormal malaria increases should be defined and eventually, thresholds established for investigation and response, with cut off points (number of malaria cases) established according to malaria case loads in the respective health facilities.
5. Appropriate control strategies are established to prevent malaria transmission in the identified seasonal hot spots.
6. Mechanisms/interventions are established to prevent malaria resurgence (Resurgence is defined as malaria positivity rate back to greater than 5% and annual incidence of more than 10 per 1000 population with high year round transmission).

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2.8 Operational Research

1.1.1 1. Introduction

Case management and drug efficacy monitoring have been a priority area for operational research. Since 2004 impact of ACT has been monitored in two sentinel sites through regular prevalence studies, treatment compliance and occurrence of side effects at household level. New round of efficacy studies are planned in 2011-2012. This operational research was started by WHO and has continued with Karolinska institute in Sweden. Entomological surveillance on vector bionomics and insecticide resistance has been another research area conducted in seven sentinel sites. This work was also initiated by WHO and has continued with Ifakara Institute and the Liverpool School of Tropical Medicine Recently, feasibility study on malaria elimination has been conducted with the Clinton Foundation. This is being followed by studies on sustainable financing of control and elimination. A study is under way with University of San Francisco on genotyping circulating parasite strains to assess the problem of importation in maintaining local transmission and preventing elimination.

The Henry M. Jackson Foundation for the Advancement of Military Medicine Inc. is providing support to malaria public health and research projects in Zanzibar and is planning to support MoH in particular through ZMCP in malaria interventions related to malaria microscopy, malaria rapid diagnostics and malaria diagnostic quality assurance/quality control and research.

The research work is conducted by program staff and does offer also opportunities for postgraduate training and development, however there may be need to consider local research assistants in the program and at sentinel sites to support the work and create opportunities to help to expand long term local capacity. The program is open to collaborations with institutions in mainland Tanzania and internationally. The ZMCP is still challenged to set its own research priorities and agenda because of its dependence on outside financial support.

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SWOT Analysis

Operational Research

STRENGTHS	WEAKNESSES
a. Sentinel sites for antimalarial efficacy trial are in place. b. Entomological sentinel sites are available with maximum required criteria c. There is good working collaboration between Programme, partners and local researchers d. Medical Ethical committee is in place with required number of members	a. Inadequate funds for research activities b. Limited skills and appropriate local researchers c. Partners dependent d. Lack of interest from external researches to the local planned research questions e. Lack of local data base on the conducted studies
OPPORTUNITIES	**THREATS**
a. Presence of Department of Policy, planning and research at the MoH b. Many partners with interest in malaria and researches c. Good collaboration and acceptance from local community d. Sites accessibility and good communication infrastructure	a. Diminishing donor funding b. Poor remuneration of staff c. Partner dependency

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1.1.2 Research Priorities

1. Relative imported case risk (ICR) by month from mainland migrants
2. Monitor efficacy of antimalarials
3. Monitor insecticides effectiveness
4. Conduct KAP studies on community perceptions

1.1.3 Recommendations

1. ZMCP to establish a data base on ongoing and completed research studies
2. ZMCP to establish a research agenda with financing to drive the elimination program
3. Operational research findings should be used to orient program and policy makers on informed and evidence based activities.

Conclusion

Malaria elimination is recognized as a priority in the national development and health agenda by the policy makers and development partners. The technical and infrastructural capacities of the Zanzibar health system at all levels and ZMCP at national level are excellent. The ZMCP has made significant progress towards universal coverage and MDG targets with equitable delivery of a package of interventions which include public information and education and community mobilization, combination of vector control interventions, rapid testing and treatment of all fever cases and malaria early epidemic detection surveillance system. This has reduced malaria towards historical low levels. This success was possible due to substantial political, financial and technical support from the national and international partners. This investment has to be sustained to achieve elimination of all local indigenous cases and prevent re-introduction.

Key recommendations

The MPR team makes the following strategic recommendations to achieve the objective of elimination in an effective and efficient way:

1. To continue to test all fever cases and treat to cure and rapidly report.
2. To shift to individual malaria case based surveillance with 24 hour notification and 48 hour rapid response and containment with line listing weekly of all malaria cases
3. To regularly update malaria stratification maps at lowest administrative level and identify malaria foci within districts and in health facility catchment areas
4. To revise the program strategy of universal coverage of combined vector control interventions towards targeted interventions based on malaria surveillance and mapping.
5. To develop specific strategies for malaria control in travellers and seasonal labor and other mobile populations.
6. To establish capacity in districts and at community level to conduct surveillance and target activities to identify and eliminate malaria foci.

Draft 05/10/2011

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- Guidelines for malaria surveillance and response ZMCP 2011
- Protocol for pro-active case detection ZM

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Annexes

Annex 1*: Time plan for MPR implementation*

Phases	S/No	Activities	Time Lines															
			Jul.				Aug.				Sep.					Oct.		
			27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	43
Phase One	1	The ZMCP - MPR Secretariat, is planning to conduct 2 days meeting to orient ZMCP staffs. The meeting will be held in Zanzibar Town	X															
	2	1 day meeting to orient Ministry Officials and Partners/stakeholders on MPR, (will include selection of review task force)	X															
	3	Throughout the planning, implementation, and dissemination of the MPR, Steering Committee, Internal and External Consultants routinely meet to discuse the progress. These meetings will be held in Zanzibar Town. (4 times)		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
	4	5 days meeting planned to be conducted to enable the MPR secretariat and consultants to review and update checklist for thematic desk review. The meeting will be held in Zanzibar Town			X													
Phase Two	5	Conduct thematic Desk Review, producing thematic report, updating field data collection tools and pre-testing				X	X	X										
	6	Field visit preparations (Conesus on thematic reports findings, familiarization of data collection methods and tools)							X									
	7	Central visit to national institutions and stakeholders								X								
	8	District and community visits									X							
	9	Sharing of reports and consensus on field findings										X						
Phase Three	10	Preparing Draft report (inducing findings from both Desk review and Field visits) & Development of executive summary, Aide-memoire and power point presentation of key findings and recommendation											X	X				
	11	1 day meeting to Partners/stakeholders on MPR, presenting draft report, Aide-memoire													X			
	12	Incorporating inputs from the stakeholders meeting and finalizing MPR report														X		
	13	1 day Dissemination meeting to Ministry Officials and Partners/stakeholders and others															X	
	14	Dissemination and publication																X

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Annex 2: ***IRS coverage trends: 2006-2011***

	Location	Sprayed	Not sprayed	Targeted	Coverage
First round (June – July 2006)	Unguja	123,613	8640	132,253	93.5%
	Pemba	78,406	359	78765	99.5%
Second round (Jan – Feb 2007)	Unguja	177,657	18810	136,467	86.2%
	Pemba	99,316	76	99392	99.2%
Third round (Aug – Sept 2007)	Unguja	133,169	6102	139,271	95.5%
	Pemba	79,488	741	80229	99.1%
Fourth round (Nov -2008)	Unguja	126,490	11647	138,137	91.6%
	Pemba	74241	2061	76302	97.8%
Fifth round (Jan – Feb 2010)	Unguja	115,199	16162	131,361	87.7%
	Pemba	70847	7360	78207	90.6%
Sixth round (Jan – Feb 2011)	Unguja	119,908	7874	127,582	94.0%
	Pemba	74917	3420	78337	95.6%

Source ZMCP 2011

Annex 3: ***Performance indicators on vector control activities***

Indicator	Baseline 2002	Achieved by 2005	Target 2008	Target 2010	Achieved 2010	Target 2012
% of children under five who slept under an ITN/LLIN the previous night	0	36.9	70	90	76	95
% of pregnant women who slept under an ITN/LLIN the previous night	2.9	34.5	70	90	72	95
% of households owning at least one ITNs/LLIN	3	45.8	80	95	91.2	95
% of conventional nets retreated	2	46	60	70	81.8	70
% of households protected by IRS	0	94	85	85	95.63	85

Source: Malaria Indicator Survey of the RBM M&E

Annex 4: ***Services offered at different health facilities and hospitals 2010***

Level	Unit	Malaria Services Offered
Level I: Primary	PHCU and PHCU+	1st line and alternative antimalarials, IPTp, RDTs/microscopes, Pre-referral treatment
Level I: Primary Health Care Centre	PHCC (Cottage Hospitals)	1st line, and alternative antimalarials, IPTp, Microscopy, IV infusion, Blood transfusion, Referral only when intensive care is needed
Level II: Secondary	District Hospitals	1st line and alternative antimalarials, IPTp, Microscopy, IV infusion, Blood transfusion
Level III: Tertiary	Referral Hospital	1st line and alternative antimalarials, IPTp, Microscopy, IV infusion, Blood transfusion, Intensive care
Level III: Tertiary – Specialized hospitals	Maternity Hospital Mental Hospital	1st line and alternative antimalarials, Microscopy, IPTp , Blood transfusion

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Annex 5: *Performance indicators and targets*

Indicator	Performance/ status	Sources	Remarks
Communication strategy document in place and operational	Communication strategy 2008 - 2011 document in place and operational since 2009	Communication Strategy (2008 - 2011), 2009.	• Some of Indicators are not direct in line with MDGs, Abuja Declaration, and MKUZA. • Communication activities are conducted in ad hoc depending on donor support
Number of World Malaria Day successfully implemented	Three (2009, 2010, 2011) World Malaria Day successfully implemented.	ZMCP Annual Reports (2009 2011)	
Number of CORPS trained	Up to 2011 a total of 150 CORPS trained in Unguja and Pemba	IEC Section Progress Report, 2011	• No systematic reporting system. • Most of CORPS do not report accordingly. • Overlapping and publication of activities between CORPS and Malaria Health Committee, these two are used interchangeable • Training follow up is not conducted
Creation of an appropriate health behaviors and actions regarding early health seeking and recognition of signs and symptoms on malaria among the community are increased from 7% to 90% by 2012. Review this	There is a percentage decrease of an appropriate health seeking behavior among community from 55.6% in 2007 to 28% observed in 2010.	MIS 2010	• It look too ambition to increase the percentage for 83% within 4 years. (7% and 28%).
Level of awareness on the sign and symptom for sever Malaria among community member is increasing by 80% in 2010	Increased by 15% from 52.5 in 2007 to 67.7% in 2010.	MIS 2010, MoH	
Increase use of ITNs/LLINs for pregnant women from 73% in 2007 to 90% by 2012.	The available data revealed that the ITNs/LLINs for pregnant women has increased from 73% in 2007 to 80% 2010	MIS 2010	
Increase in use of ITNS/LLINs to children under five from 74 % in the year 2007 to 90% in 2010.	The percentage of children under five who use ITN/LLINs increased to from 74% in 2007 to 79%.	MIS 2010	• Indicator has no baseline data. 74% found in 2007 MIS.
Increase the percentage of under five having prompt access to and receive appropriate management for febrile illness within 24 hours from 40.4% in 2007 to 70% in	Increased from 32% in 2007 to 76% in 2010.	MIS 2010	

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2010.			

Annex 6: *Indicators as per malaria strategic plan*

1: Integrated Vector Management implementation approaches - Use of ITNs/LLINs and net re-treatment					
Indicator	**Baseline**	**Achieved by 2005**	**Target 2008**	**Target 2010**	**Target 2012**
% of children under five who slept under an ITN/LLIN the previous night	0	36.9	70	90	95
% of pregnant women who slept under an ITN/LLIN the previous night	2.9	34.5	70	90	95
% of households owning at least one ITNs/LLIN	3	45.8	80	95	95
% of conventional nets retreated	2[a]	46	60	70	70
% of households protected by IRS		94*	85	85	85
2. Malaria Case management					
Indicator	**Baseline 2002/3**	**Achieved by 2005**	**Target 2008***	**Target 2010**	**Target 2012**
% of children under five with fever receiving treatment according to national policy within 24 hours of onset of fever	7	13.4	65	70	80
% of children under five with fever/uncomplicated malaria being managed according to national policy	42	67	75	90	90
% of under fives with severe malaria receiving correct treatment at health facilities	73	69	75	90	90
% of malaria cases confirmed in health facilities where microscopy is available	25	61	80	90	90
% of health facilities reporting no stock outs of nationally recommended antimalarial drugs for more than one week, during the previous three months	8.3	AS: 89.2 AQ: 91.9	90	100	100
Prevalence of malaria infection (all ages)	11.15	2.6*	2	0.5	0.5
Mean haemoglobin (<5 years)	9.7	9.9*	7	10	11
3. Malaria in pregnancy					
Indicator	**Baseline 2002**	**Achieved by 2005**	**Target 2008***	**Target 2010**	**Target 2012**
% of pregnant women attending ANC receiving both IPT1 and IPT2 in the 2nd and 3rd trimesters		47.8 (IPT2)	60	90	95
% of pregnant women who slept under an ITN the previous night	0.3 (2002)	34.5	60	90	95
4. Epidemic preparedness and respond					
Indicator	**Baseline 2003***	**Achieved by 2005**	**Target 2008***	**Target 2010**	**Target 2012**
Number of districts with preparedness plan for malaria epidemic	NA	NA	10-May	10-Oct	10-Oct
% of health care facilities with malaria epidemic early detection system in place (malaria monitoring charts)	NA	NA	50%	100%	100%
Number/proportion of meteorological stations reporting weather data	NA	NA	10 (100%)	10 (100%)	10 (100%)

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Number of active entomological sentinel sites providing data to the programme on regular base	0	5	7	10	10
% of malaria epidemic alert investigated/verified and reported	NA	NA	100%	100%	100%
% of episodes responded within two weeks from the detection	NA	NA	100%	100%	100%

7: Diagnosis and treatment baseline, targets and achievements:

Indicator	Baseline 2002/3	Achieved by 2007	Achieved by 2010	Target 2010	Target 2012
% of children under five with fever receiving treatment according to national policy within 24 hours of onset of fever	7	40.4	79	65	90
% of children under five with fever/uncomplicated malaria being managed according to national policy	42	68	71	90	90
% of fever/uncomplicated malaria (all ages) managed according to national policy	55.9 (2007)	68	71	70	80
Prevalence of malaria infection (all ages)	11.15	2.6*	<1	0.5	0.5

6. Malaria in pregnancy: Indicators, Baseline and Targets: As above

Indicator	Baseline 2002	Achieved by 2007	Achieved by 2010	Target 2010	Target 2012
% of pregnant women attending ANC receiving both IPT1 and IPT2 in the 2nd and 3rd trimesters/% of pregnant women on IPT according to national policy	NA	?	72	65	85

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Annex 8*: People involved in MPR*

Thematic Area	Review teams	
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External expertise		

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Dr. Juma, Elizabeth Kenya Programme Manager

Dr. Joseph, Zimbabwe Programme Manger

Dr Ibrahima Socé Fall

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