ROLL BACK MALARIA IN SOUTHERN AFRICA

BASELINE 2001

WORLD HEALTH ORGANISATION
SOUTHERN AFRICA MALARIA CONTROL PROGRAMME

JULY 2002

ACRONYMS

ADB	African Development Bank
AusAID	Australian Agency for International Development
BRI	Blair Research Institute
CDC	Centres for Disease Control and Prevention
CISM	Centro de Investigaçao em Saude de Manhiça
DANIDA	Danish Agency for Development Assistance
DFID	Department for International Development (United Kingdom)
HIS	Health Information System
IPT	Intermittent Presumptive Therapy
IRS	Indoor Residual Spraying
ITN	Insecticide Treated Nets
JICA	Japanese International Cooperation Agency
LSTM	London School of Tropical Medicine
MRC-SA	Medical Research Council of South Africa
NMCP	National Malaria Control Programme
NORAD	Norwegian Agency for Development Cooperation
PSI	Population Services International
RBM	Roll Back Malaria Initiative
SAMC	Southern Africa Malaria Control Programme
SCF	Save The Children Fund (United Kingdom)
SMA	Social Marketing Association
TDRC	Tropical Disease Research Centre, Zambia
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Fund
UNFPA	United Nations Population Fund
USAID	United States Agency for International Development
WHO	World Health Organisation
WVI	World Vision International

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1. INTRODUCTION

Roll Back Malaria aims to halve malaria morbidity and mortality by 2010. In order for us to measure our success in achieving this target and outcomes that will contribute to it, it is important we establish a baseline for the core indicators that are being used to monitor and evaluate RBM in Southern Africa. To this end, available data, including estimates where appropriate, have been compiled to establish a baseline for RBM in Southern Africa. Monitoring should be regarded as a continuous process. The estimates presented here are likely to be improved upon as surveillance and routine information systems as well as other data collection systems in the subregion are strengthened and expanded.

2. DATA SOURCES AND METHODS

There is a wide range of malaria and malaria control data available in Southern Africa. Such data are from surveillance and routine information systems, sentinel sites, periodic malaria and/or health surveys, operational research, desk reviews, needs assessments and situation analyses.

Over the last 18 months, the Southern Africa Malaria Control Programme has worked with NMCPs, notably Botswana, Malawi, Swaziland, Zambia and Zimbabwe to review their information systems and establish national malaria databases. In addition, during this period some countries have conducted RBM desk reviews, district situation analysis and baseline surveys. Table 2.1 summarises the progress made by countries in building and managing an evidence-base for rolling back malaria.

Table 2.1. Progress in establishing an evidence-base for RBM by country

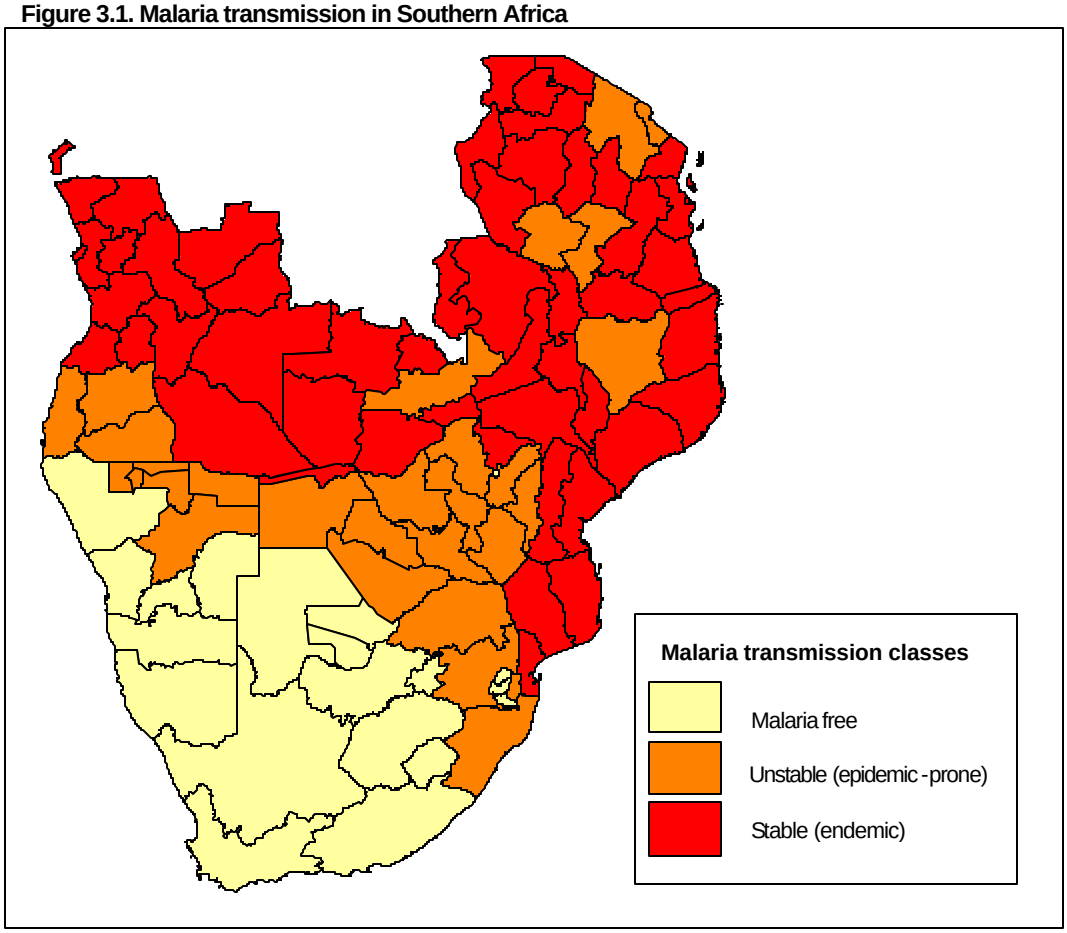
Country	National review of routine information and surveillance systems	National database	Accelerated malaria control reviews	Annual Report	RBM desk review; WB rapid assessment	RBM district situation analysis (no of Districts)	Baseline survey (no of districts)
Angola	No	No	-	2000/01	2001	-	2002 (4 Provinces)
Botswana	Yes	Yes – Excel; HealthMap	Nov 1997 Feb 1999	2000/01	July 2000 (RBM)	July 2000 (3)	-
Malawi	Yes	Yes – Excel; HealthMap	Oct 1997	1999/00	Feb 1999 (WB)	2001	2001 (8)
Mozambique	No	No	May 1998	2000/01	Feb 1999 (WB)	-	2001 (5)
Namibia	No	No	-	2000/01	2001	-	-
South Africa	No	(Summary in Excel)	-	2000/01	-	No	-
Swaziland	Yes	Yes – Excel, Access (MRC MIS); HealthMap	-	2000/01	-	No	March 2001 (3)
Tanzania	Yes	No	Nov 1997	2000/01	Nov 1998 (WB); Aug 1999 (RBM)	2001	2001 (10)
Zambia	Yes	Yes – Excel; HealthMap	Oct 1997	2000/01	April 2000 (RBM)	2001	2001 (10)
Zimbabwe	Yes	Yes – Excel	July 1998	2000/01	Mar 1999 (WB)	Dec 1999 (3)	May 2001 (15)

At the end of this document, a full list of references is given. It should be noted that the estimates given are either national ones or for the districts were the RBM baseline survey was conducted.

3. MALARIA TRANSMISSION

In Southern Africa, the intensity of malaria transmission varies considerably both temporally and spatially. Figure 3.1 maps malaria transmission by province [1] using three classes: malaria free, unstable (epidemic-prone) malaria and stable malaria. From the map it can be seen there are two frontlines of malaria transmission. The first being the juncture between malaria-free and unstable areas which runs through South Africa, Botswana and Namibia. The second frontline – which marks the change from malaria-epidemic to malaria-endemic transmission follows the Mozambique western border until the River Zambezi where it turns west and runs along the northern Zimbabwe, Botswana and Namibian/Angolan borders to the Atlantic Ocean. In addition, there are islands of lower levels of malaria transmission, such as in Tanzania (Northern and Southern Highlands) and possibly Mozambique, within the stable transmission area.

Figure 3.1. Malaria transmission in Southern Africa



1 It should be noted that malaria transmission varies appreciably within many of the provinces and in some cases from malaria-free to malaria-endemic (e.g. Northern Province, Zambia; Midlands Province, Zimbabwe).

Due to the nature of malaria transmission in Southern Africa, success in RBM will result in:

- Reduced malaria morbidity
- Reduced malaria mortality
- Reduced malaria parasitaemia in children
- An extension of the malaria-free zone
- A decline in the intensity of transmission in some malarious areas such as the plateau area of Zambia.

4. RBM INDICATORS

At the global level, a core set of indicators to monitor RBM has been agreed upon and adopted by the WHO Regional Office for Africa. Within Southern Africa these indicators have been adapted to reflect the epidemiological and socio-economic setting of the subregion. The core indicators are given below. The main additions to the indicators centre on indoor residual spraying which is an appropriate and important component of a number of NMCPs in Southern Africa. An indicator related to this is the percentage of households using malaria prevention measures. This is first step to establishing a 'malaria-safe index' that households, communities, districts and countries can be measured and ranked by. For epidemics the global indicator has been divided into two in order to measure detection and response more precisely.

Table 4.1. Core indicators for monitoring RBM in Southern Africa

1. Impact
1.1. Under five mortality (all-cause) rate
1.2. Malaria mortality rate (under-fives, all ages, pregnant women)
1.3. Morbidity attributed to malaria (under-fives, all ages, pregnant women)
1.4. Case fatality rate for malaria cases admitted to hospitals and health centres with inpatient facilities (under-fives, all ages, pregnant women)
1.5. Prevalence of malaria parasitaemia among 2-9 year olds
1.6. Percentage of people living in malaria-free areas
2. Outcome
2.1. Percentage of people with a malaria attack receiving appropriate treatment within 24 hours
2.2. Percentage of people with uncomplicated malaria properly managed at health facilities
2.3. Percentage of people with severe malaria and correctly managed at health facilities
2.4. Percentage of children under-five sleeping under treated mosquito nets
2.5. Percentage of pregnant women sleeping under treated mosquito nets
2.6. Percentage of households owning at least one treated mosquito net
2.7. Percentage of pregnant women on antimalarial chemoprophylaxis or intermittent presumptive treatment
2.8. Percentage of households in targeted areas that are sprayed
2.9. Percentage of all households in malarious areas that are sprayed
2.10. Percentage of all households in malarious areas with malaria prevention measures[2]
2.11. Percentage of malaria outbreaks detected within two weeks of onset
2.12. Percentage of detected malaria outbreaks properly controlled within two weeks
2.13. Percentage of villages taking organised action on malaria issues.
3. Process
3.1. Percentage of health facilities with no stock-outs of 1st, 2nd, 3rd-line antimalarial drugs and essential items during the last 3 months. 3.2. Percentage of facilities with adequate parasite detection services[3]
3.3. Percentage of community health workers holders who have received training in case management in last 24 months
3.4. Percentage of clinicians who have received training in case management in last 24 months
3.5. Percentage of nurses who have received training in case management in last 24 months
3.6. Number of national level financing, technical and other partners
3.7. Number of district level financing, technical and other partners

[2] Use of treated mosquito nets, residual house spraying, screens.
[3] Includes facilities, equipment, trained personnel

5. IMPACT INDICATORS FOR SOUTHERN AFRICA – BASELINE 2001

There are approximately 145 million people in Southern Africa (see Table 5.1). Out of these, 92 million live in areas of malaria transmission. In the predominantly stable transmission countries – Angola, Malawi, Mozambique, Tanzania and Zambia – there are an estimated 14,524,000 under-five year olds and 3,520,000 pregnant women at risk of malaria. In the predominantly unstable transmission countries – Botswana, Namibia, South Africa, Swaziland and Zimbabwe – where all age groups have a high risk of malaria due to low levels of acquired immunity, it is estimated 12,231,000 people are at risk of malaria.

Table 5.1. Population At Risk, 2001

Country	Total	Under-fives	Pregnant women	% of population living in malarious areas	Total population living in malarious areas	Under-fives living in malarious areas	Pregnant women living in malarious areas
Angola	12699476	2437029	602717	100	12699476	2437029	602717
Botswana	1695482	265292	58954	40	678193	106117	23582
Malawi	10441340	1763230	469860	100	10441340	1763230	469860
Mozambique	16900696	2973678	715068	100	16900696	2973678	715068
Namibia	1690740	266474	60238	66	1115888	175873	39757
South Africa	44421820	5959853	1314442	10	4442182	595985	131444
Swaziland	1006357	147640	36712	30	301907	44292	11014
Tanzania	34160286	5995813	1405013	90	30744257	5396232	1264512
Zambia	11056203	1953631	468120	100	11056203	1953631	468120
Zimbabwe	11384720	1885310	417819	50	5692360	942655	208910
Total	145457120	23647950	5548943	63	91637986	16388722	3934983

Source: SAMC estimates based on adjusted most recently available census data

In countries with stable transmission, the burden of malaria is greatest among under-fives. In such countries malaria can be responsible for up to 30-40% of child deaths. In Southern Africa, under-five all cause mortality ranges from 62 per 1000 in Namibia to 191 per 1000 in Angola.

Table 5.2. Under-Five All Cause Mortality Per 1000

Country	Value	Year	Source
Angola	191	2000	
Botswana	94	2000	
Malawi	189	2000	Malawi DHS 2000
Mozambique	162	2000	
Namibia	62	2000	Namibia DHS 2000
South Africa	68	2000	
Swaziland	94	2000	
Tanzania	123	2000	
Zambia	150	2000	
Zimbabwe	107	2000	

Estimating malaria mortality rates is extremely difficult. Tables 5.3. and 5.4 present estimates of malaria mortality (all ages) and malaria mortality among under-fives respectively. Malaria mortality can be calculated using the best available all cause mortality estimates and the proportion of these deaths that are estimated to be due principally to malaria (through sentinel sites and/or routine information systems). Employing this methodology is more feasible for under-fives as reasonably robust estimates of under-five all cause mortality exist. For the overall (all age) malaria mortality rate, the reliability of the estimates falls sharply as estimates of the crude

death rate are generally poor and their margin of error probably quite large. Suffice to say, the estimates in Table 5.3 should be treated with considerable circumspection. More broadly In addition, the impact of HIV/AIDS on the crude death rate and under-five mortality rate and the misreporting of these deaths as other causes including malaria decreases the accuracy of the estimates. This is particularly the case for the unstable transmission countries where HIV prevalence is at high levels.

In total, it is currently estimated that malaria is responsible for up to 300,000 deaths per annum in Southern Africa. Among under-fives, it is estimated that 99,000 deaths can be attributed to malaria every year. In the predominantly stable transmission countries – Angola, Malawi, Mozambique, Tanzania and Zambia – for approximately every 25 children born, one will die of malaria before their fifth birthday.

Table 5.3. Malaria Mortality (All Ages)

Country	Malaria deaths per annum	Malaria mortality per 1000	Year	Source
Angola	49232	4.1	2001	SAMC estimate
Botswana	413	0.3	2001	SAMC estimate
Malawi	44165	4.3	2001	SAMC estimate
Mozambique	67028	4.2	2001	SAMC estimate
Namibia	393	0.2	2001	SAMC estimate
South Africa	691	0.0	2001	SAMC estimate
Swaziland	254	0.3	2001	SAMC estimate
Tanzania	96470	3.0	2001	SAMC estimate
Zambia	27999	3.2	2001	SAMC estimate
Zimbabwe	13672	1.1	2001	SAMC estimate

Table 5.4. Malaria Mortality (Under-Fives)

Country	Under-five malaria deaths per annum	Under-five malaria mortality per 1000	Year	Source
Angola	18619	38.2	2001	SAMC estimate
Botswana	100	1.9	2001	SAMC estimate
Malawi	12957	36.7	2001	SAMC estimate
Mozambique	19269	32.4	2001	SAMC estimate
Namibia	104	2.0	2001	SAMC estimate
South Africa	162	0.1	2001	SAMC estimate
Swaziland	56	1.9	2001	SAMC estimate
Tanzania	35547	29.6	2001	SAMC estimate
Zambia	10725	27.5	2001	SAMC estimate
Zimbabwe	1493	4.0	2001	SAMC estimate

The incidence of reported malaria morbidity varies considerably within Southern Africa. In part, this is a reflection of variations in malaria transmission. However, of equal, if not more importance, is the variation in reporting systems in terms of HIS coverage and the case definition of malaria that are used (i.e. clinical or confirmed). Table 5.5[4] illustrates this with Botswana's reported incidence of malaria per 1000 population at risk being higher than Mozambique's. Estimates have been calculated that take into account the adjust for variations in reporting systems. The estimates have factored in HIS coverage and the slide positivity rate when adjusting the reported malaria cases. Using this methodology, the estimated incidence of confirmed malaria per 1000 population at risk ranges from below 50 in Botswana,

[4] It should be noted that the incidence of malaria is calculated using the population residing in malarious areas as the denominator.

South Africa and Swaziland to over 300 in Malawi, Mozambique, Tanzania and Zambia.

Table 5.5. Incidence Of Reported And Estimated Malaria

Country	Mean 1996-2000	
	Reported incidence per 1000 population at risk	Estimated incidence per 1000 population at risk
Angola	-	296.6
Botswana	101.8	35.9
Malawi	431.0	344.8
Mozambique	48.3	386.5
Namibia	505.4	178.4
South Africa	6.7	6.7
Swaziland	94.2	21.2
Tanzania	103.8	342.6
Zambia	356.1	311.5
Zimbabwe	225.0	76.8

Source: NMCP reported data; SAMC estimates

Malaria parasite ratios among children (2-9 year olds) give an indication of the intensity of malaria transmission as well as the prevalence of asymptomatic malaria infections. Successful vector control interventions, principally indoor residual spraying (IRS), have reduced parasite ratios in Botswana, South Africa, Swaziland, southern Mozambique, Namibia and Zimbabwe. The resumption of IRS in Zambia is also likely to be reducing parasite ratios in the Copperbelt. Likewise, a number of ITN projects that have achieved high coverage levels have demonstrated a decline in parasite ratios among children. Due to the nature of malaria transmission in Southern Africa, parasite ratios are regarded as one of the core impact indicators that RBM will be measured against. NMCPs in the subregion recognise the importance of this indicator and have begun conducting parasite ratio surveys.

Table 5.6 gives an indication of how parasite ratios vary within the subregion.

Table 5.6 Malaria Parasite Ratios Among 2-9 Year Olds

Country	Lowest transmission	Highest transmission	Year	Source
Angola	20	60	2001	SAMC estimate
Botswana	0	13	1980s/90s	Botswana National Malaria Database
Malawi	40	80	2001	Malawi National Malaria Database
Mozambique	20	80	2001	SAMC estimate
Namibia	0	15	2001	SAMC estimate
South Africa	0	5	2000	SAMC estimate
Swaziland	0	5	2001	LSDI Survey 2000, Lubombo School Survey 1999
Tanzania	20	80	2001	SAMC estimate
Zambia	12	93	2001	Zambia RBM baseline survey 2001; Baseline Malariometric Survey Report for Chipata, Lundazi, Chama, Samfya and Kitwe - April-June 1999
Zimbabwe	0	30	2001	Zimbabwe RBM baseline survey

6. OUTCOME INDICATORS FOR SOUTHERN AFRICA – BASELINE 2001

Before an impact is made on malaria morbidity, mortality and transmission, a number of outcomes need to be achieved. Below are estimates of the key RBM outcome indicators being used in Southern Africa.
Access to health facilities is not on the core list of RBM indicators. However, we have included here to underline the importance of it if we are to improve access to malaria case management. It can be seen from Table 6.1 that access to health facilities (defined as 8 km radius and holding essential drugs) is varies markedly in the subregion.

Table 6.1. Access To Health Facilities

Country	Percent	Year
Angola	24	2001
Botswana	85	2001
Malawi	80	2001
Mozambique	60	2001
Namibia	85	2001
South Africa	95	2001
Swaziland	85	2001
Tanzania	93	2001
Zambia	75	2001
Zimbabwe	85	2001

Source: SAMC estimates

Related to access to health care is the core RBM indicator, the percentage of under-fives receiving treatment within 24 hours of onset of fever. Estimates are available for only 5 o ut of the 10 countries in the subregion. In addition, it should be noted that the estimates vary in terms of source of treatment (health facility, home -based, traditional healers etc).

Table 6.2. Percentage Of Under-Fives Receiving Treatment Within 24 Hours Of Onset Of Fever

Country	Percent	Year	Source	Notes
Angola	-	-	-	
Botswana	-	-	-	
Malawi	83.5	2000	Malawi DHS 2000	Includes home-based treatment
Mozambique	-	-	-	
Namibia	-	-	-	
South Africa	-	-	-	
Swaziland	80.4	2001	Swaziland RBM Baseline Survey 2001	health facility-based treatment
Tanzania	11.3	2001	Tanzania RBM baseline survey	
Zambia	59.5	2001	Zambia RBM Baseline Survey 2001	includes home-based treatment, drug vendors, traditional healers
Zimbabwe	64.2	2001	Zimbabwe RBM baseline survey	health facility-based treatment

Correct case management of uncomplicated and severe malaria is necessary if malaria mortality is to be reduced. Table 6.3 presents available estimates of the percentage of malaria patients that were correctly managed at health facilities. Due to sampling issues as well as the definition of the term ‘correct’, comparison between countries is almost impossible.

Table 6.3. Percentage Of Malaria Patients Correctly Managed At Health Facilities

Country	Uncomplicated malaria	Severe malaria	Year	Source	Notes
Angola	-	-	-		
Botswana	-	-	-		
Malawi	-	47	1998	Evaluation of Accelerated Malaria Control Programme 1998	Based on 60 records reviewed in 3 district hospitals
Mozambique	-	-	-		
Namibia	-	-	-		
South Africa	-	-	-		
Swaziland	94	-	2001	Swaziland RBM Baseline Survey 2001	
Tanzania	54.3	28.6	2001	Tanzania RBM Baseline Survey 2001	
Zambia	88	89	2001	Zambia RBM Baseline Survey 2001	
Zimbabwe	-	-	-		

Insecticide-treated materials is one of the key interventions of Roll Back Malaria. Table 6.4 presents estimates of ITN and net coverage for under-fives, pregnant women and households. The use of ITNs is low throughout the subregion. From the available data it can be surmised that in Southern African countries between a tenth and a third of nets in existence are actually treated with insecticide. Mosquito net ownership by household is estimated to vary between 0% (Swaziland) and 37% (Tanzania). The variation is partly due to indoor residual spraying historically being the main vector control strategy of NMCPs south of the Zambezi.

Table 6.4. Mosquito Net Coverage

Country	Under-fives (%)		Pregnant women (%)		Households (%)		Year	Source
	untreated	Treated	untreated	treated	untreated	treated		
Angola	-	-	-	-	1	-	2001	SAMC estimate – national
Botswana	-	-	-	-	26	-	2001	Estimated from surveys in Botswana National Malaria Database – national
Malawi	7.6	2.9	7	3	13.1	5.9	2000	Malawi DHS 2000 – national
Mozambique	-	-	-	-	5	-	2001	SAMC estimate – national
Namibia	-	-	-	-	10	-	2001	SAMC estimate – national
South Africa	-	-	-	-	10	-	2001	SAMC estimate – national
Swaziland	0	0	0	0	1	0	2001	Swaziland National Malaria Database – national
Tanzania	45.7	11.3	35.7	7.6	37	11.9	2001	Tanzania RBM baseline Survey – RBM districts
Zambia	12.7	-	22.7	-	18	-	2001	Zambia RBM baseline survey/ USAID Malaria Survey 1999/ SAMC estimate – national
Zimbabwe	11	1.1	10	1	7	0.7	2001	Zimbabwe RBM Baseline survey 2001 – RBM districts

With the exception of Malawi, chemoprophylaxis rather than intermittent presumptive therapy (IPT) has been used in Southern Africa[5] to protect women during pregnancy. Available data shows generally low rates of coverage (Table 6.5) with the notable exception of Zimbabwe where 82% of women who were recently pregnant reported taking chloroquine during their pregnancy.

[5] At the time of writing, several countries were in the process of changing from using chemoprophylaxis to IPT for pregnant women.

Table 6.5. Protection Against Malaria In Pregnancy

Country	% of pregnant women receiving chemoprophylaxis/IPT	Year	Note	Source
Angola	-	-	-	
Botswana	-	-	-	
Malawi	29.3 (67.5)	2000	1 dose (2 doses)	Malawi DHS 2000
Mozambique	-	-	-	
Namibia	-	-	-	
South Africa	-	-	-	
Swaziland	9	2001	CQ	Swaziland baseline survey, 2001
Tanzania	29.3	2001	CQ	Tanzania RBM baseline survey 2001
Zambia	21	2001	CQ	Zambia RBM baseline survey
Zimbabwe	81.9	2000	CQ	Zimbabwe RBM baseline survey

Indoor residual spraying is the main vector control strategy employed by Botswana, Mozambique, Namibia, South Africa, Swaziland and Zimbabwe. In addition, Zambia has recently restarted IRS in the Copperbelt and plans to extend it to Lusaka and Livingstone; while Angola is considering using IRS for the 2002/2003 transmission season. Table 6.6 shows IRS coverage for Southern African countries.

Table 6.6. Coverage Of Indoor Residual Spraying

Country	% of households in targeted areas sprayed	% of all households in malarious areas that are sprayed	Year	Source
Angola	-	0		
Botswana	66.8	62.2	2001	Botswana National Malaria Database
Malawi	-	0		
Mozambique	-	-		
Namibia	-	-		
South Africa	-	-		
Swaziland	95	-	1999/2000	Swaziland National Malaria Database
Tanzania	-	-		
Zambia	-	8.4	2001	Zambia RBM Baseline Survey
Zimbabwe	-	56.3	2001	Zimbabwe RBM Baseline Survey

SAMC aim to develop an index of malaria protection that can be used at different levels from the household and to the national level. Table 6.7 gives an estimate of the percentage of households by country that are protected against malaria by one or more methods of prevention measures. These are defined as the use of mosquito nets, indoor residual spraying and screening.

Table 6.7. Households Protected Against Malaria

Country	% of households in all malarious areas with malaria prevention measures	Year	Source
Angola	10	2001	SAMC estimate
Botswana	75	2001	SAMC estimate
Malawi	35	2001	SAMC estimate
Mozambique	10	2001	SAMC estimate
Namibia	60	2001	SAMC estimate
South Africa	90	2001	SAMC estimate
Swaziland	90	2001	SAMC estimate
Tanzania	40	2001	SAMC estimate
Zambia	25	2001	SAMC estimate
Zimbabwe	60	2001	SAMC estimate

In parts of Angola, Botswana, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe, malaria transmission is unstable and of an epidemic nature. In these countries it is important to monitor how long it takes for outbreaks to be detected and then how rapidly they are effectively responded to. Table 6.8 presents information on outbreaks and epidemics that have occurred in Southern Africa for the last three transmission seasons (1998/1999, 1999/2000, 2000/2001). Botswana, South Africa and Swaziland stand out as having detected all outbreaks within two weeks of onset and then responded effectively to them two weeks after detection. For Tanzania and Zambia no data is available.

Table 6.8. Epidemic Detection And Response

Country	Number of epidemics	Detection < 2 wks		Response <2 weeks		Years
		Number	*%*	*Number*	*%*	
Angola	3	0	0	0	0	2001
Botswana	2	2	100	2	100	1999, 2000, 2001
Malawi	-	-	-	-	-	-
Mozambique	3	2	66	2	66	1999, 2000, 2001
Namibia	3	0	0	1	33	1999, 2000, 2001
South Africa	4	4	100	4	100	1999, 2000, 2001
Swaziland	2	2	100	2	100	1999, 2000, 2001
Tanzania	-	-	-	-	-	1999, 2000, 2001
Zambia	-	-	-	-	-	1999, 2000, 2001
Zimbabwe	3	1	33	2	66	1999, 2000, 2001

Source: SAMC and NMCP records

One of the key components of Roll Back Malaria is to engage communities and increase their involvement in malaria control. Table 6.9 demonstrates the paucity of data for this area. Currently we have no estimates of the percentage of villages/communities taking organised action on malaria.

Table 6.9. Community Action Against Malaria

Country	% of villages taking organised action on malaria issues	Year	Source
Angola	-	-	-
Botswana	-	-	-
Malawi	-	-	-
Mozambique	-	-	-
Namibia	-	-	-
South Africa	-	-	-
Swaziland	-	-	-
Tanzania	-	-	-
Zambia	-	-	-
Zimbabwe	-	-	-

7. PROCESS INDICATORS FOR SOUTHERN AFRICA – BASELINE 2001

Without a reliable drug supply, effective case management is not possible. Table 7.1 gives estimates for health facilities with no drug stock outs over a three month period for a number of Southern African countries. The data are based on relatively small samples, particularly for Malawi, and, hence, should be treated with some caution. However, it is reasonable to state that Botswana, South Africa and Swaziland have reliable drug supply systems where stock-outs of antimalarials is a very rare occurrence.

Table 7.1. Percentage Of Health Facilities With No Drug Stock Outs In The Last 3 Months

Country	1st line	2nd line	3rd line	Source	Notes
Angola	-	-	-		
Botswana	100	100	100	NMCP reports	
Malawi	89	56	56	Evaluation of Accelerated Malaria Control Programme 1998	Based on records of 9 health facilities from 3 districts
Mozambique	-	-	-		
Namibia	-	-	-		
South Africa	100	100	100	SAMC estimate	
Swaziland	90.9	100	100	Swaziland RBM Baseline Survey 2001	
Tanzania	28.6	45	33.3	Tanzania RBM Baseline Survey 2001	
Zambia	98.3	80	63.3	Zambia RBM Baseline Survey 2001	
Zimbabwe	100	92	87	Zimbabwe RBM Baseline Survey 2001	

There is limited data on the coverage and quality of parasite detection services in Southern Africa. Comparability between countries is made difficult as some baseline surveys only included inpatient facilities. In South Africa, the use of rapid diagnostic tests at the first level of care means all cases are confirmed. Botswana is also scaling up the use of rapid tests in malaria districts. However, for most countries in the subregion the cost of the tests (c. USD 1 per test) is likely to prohibit widespread use. There is a need for countries to collect additional data on laboratory services for both inpatient and outpatient facilities.

Table 7.2. Percentage Of Health Facilities With Adequate Parasite Detection Services

Country	% of facilities with adequate parasite detection services	Year	Source
Angola	-	-	
Botswana	60	-	SAMC estimate
Malawi	-	-	
Mozambique	-	-	
Namibia	-	-	
South Africa	100	2001	NMCP
Swaziland	-	-	
Tanzania	68	2001	Tanzania RBM Baseline Survey (inpatient facilities)
Zambia	33.8	2001	Zambia RBM Baseline Survey
Zimbabwe	10	2001	SAMC estimate

Information on training of health workers should be available in countries and NMCPs need to liase with the Ministry of Health department responsible for training as well as districts in order to monitor malaria case management training for different cadres. Table 7.3 is only able to present complete information for Zimbabwe.

Table 7.3. Percentage Of Health Workers Receiving Training In Case Management In Last 24 Months

Country	CHWs	Nurses	Clinicians	Year	Source	Notes
Angola	-	-	-	-	-	-
Botswana	-	-	-	-	-	-
Malawi	-	-	-	-	-	-
Mozambique	-	-	-	-	-	-
Namibia	-	-	-	-	-	-
South Africa	-	-	-	-	-	-
Swaziland	61	-	-	2001	Swaziland RBM Baseline Survey 2001	CHWs received in-service training; do not hold CQ
Tanzania	-	11.5	-	2001	Tanzania RBM baseline survey 2001	-
Zambia	-	-	-	-	-	-
Zimbabwe	31	47	29	2001	Zimbabwe RBM Baseline Survey	-

RBM aims to adds value to existing malaria control efforts by bringing in new partners as well as strengthening existing partnerships. Such partnerships at the national level can be classified as technical, financial and other partnerships. The latter includes other sectors (e.g. Education, Agriculture) that can provide entry points to communities or particular groups at risk of malaria. From Table 7.4 it can be seen countries have had varying success at establishing RBM partnerships. In the middle-income countries (Botswana, Namibia, South Africa, Swaziland) it has been particularly difficult to bring in bilateral partners.

Table 7.4. National Level Partners By Country

Country	Financial partners	Technical partners	Other partners
Angola	USAID WHO UNICEF European Union Italian Government	WHO UNICEF	Oil Companies, Diamond Companies, Lobito Port Authority and NGOs
Botswana	WHO	WHO Botswana Defence Forces UNICEF UNFPA UNDP	Botswana Defence Forces Ministry of Tourism
Malawi	WHO UNICEF JICA USAID DFID	Wellcome Trust Lab/QEH LSTM, Liverpool University of Zomba Centres for Disease Control and Prevention (CDC) WHO UNICEF PSI	
Mozambique	WHO UNICEF DANIDA USAID DFID AusAID NORAD World Bank ADB	WHO UNICEF Centro de Investigaçao em Saude de Manhiça (CISM) Medical Research Council – SA	ZENECA, Mozambique Aluminium (MOZAL), PSI, WVI, SCF UK, HAI, LWF
Namibia	WHO UNICEF	WHO LSTM, Liverpool UNICEF National Health Laboratory Services	Meteorology Service Department Social Marketing Association (SMA)
South Africa	WHO South Africa Business Trust MOZAL	WHO UNICEF MRC Durban National Health Laboratory Services – Department of Medical Entomology	

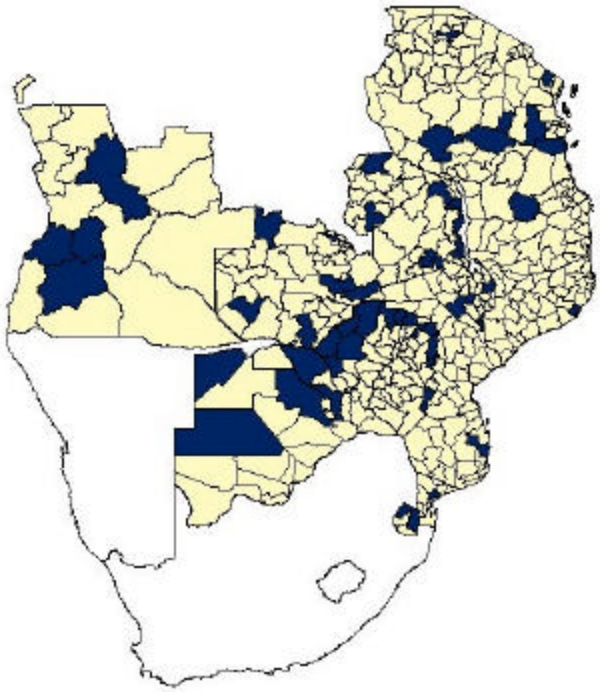
		University of Cape Town – Pharmacology Unit	
Swaziland	WHO	WHO UNICEF Medical Research Council - SA LSTM, Liverpool	
Tanzania	WHO UNICEF World Bank DFID Italian Co-operation for Development JICA USAID Netherlands Government Swiss Agency for Development Cooperation (SDC)	- WHO - UNICEF - JICA - National Institute for medical research - Ifakara Health Research and Development Centre - Muhimbili University college of health Sciences - Tanzania Essential Health Intervention Package (TEHIP)	
Zambia	WHO UNICEF USAID DFID DANIDA JICA World Bank Africa Development Bank	WHO UNICEF TDRC, Ndola CDC/Boston University Chessore, UNZA	Wold Vision, ADDRA, CARE, Red Cross NetMark ECOMED, A-Z, Church Medical Association (CHAZ)
Zimbabwe	WHO JICA	- WHO - UNICEF - JICA - Blair Research Institute - Plan International - World Vision - Save the Children - LSTM	Ministry of Education, Sports and Culture

8. RBM DISTRICTS

For RBM to be successful, malaria control delivery systems needs to be strengthened at the district level. This may prove difficult unless countries take a step wise approach to RBM and focus on a number of frontrunner districts for the first 2-3 years of implementation and then once these are strengthened and outcomes (if not impact) have been achieved, to expand to other districts. However, some countries consider that RBM needs to be implemented country-wide due to the magnitude and urgency of the malaria problem. Table 8.1 presents the status of RBM implementation by country and indicates whether a stepwise or a country-wide approach is being taken. In addition, IMCI districts are also given. It may be noted that the implementation of IMCI in countries is taking a step-wise, rather than nationwide, approach.

Country	**Status of RBM inception process**	**RBM implementation approach – nationwide or stepwise (district) focus**	**RBM Baseline Survey Districts**	**IMCI districts**
Angola	Strategic plan – Q2 2002	Huambo, Malange, Luanda (*Provinces)*	Malanje, Benguela, Huila, Huambo (*Provinces)*	-
Botswana	Implementation begun	District focus: Boteti, Chobe, Ngami, Okavango, Tutume	Ghanzi, Okavango, Tutume	4 out of 23
Malawi	Implementation begun	Nationwide	Ntchisi, Mchinji, Nkotakota, Nsanje, Nkhata-Bay, Rumphi, Mwanza, Machinga	Kasungu, Blantyre, Mzimba, Mwanza
Mozambique	Strategic plan – Draft 2001	-	Angoche, Moatize, Quelimane,	Nampula, Monapo, Ribawe, Erati, Manica, Sussundenga, Inhambane, Vilanculos,

			Massinga, Manhica	Massining
Namibia	Strategic plan – Q2 2002	District focus: North-east and north-west directorates	-	-
South Africa	Implementation begun	District focus: Messina, Mutale, Phalaborwa, Tonga, Shongwe, Barbeton, Ingwavuma, Ubumbo	-	Kwazulu-Natal, Jozini, Nzianthi, Durban, Lower Tugulea, Empageni, Uthukela, Ugu, Mapumalanga, Brits, Odi, Rustenberg, Mmbatho, Vryberg, Moeti
Swaziland	Strategic plan – Q2 2002	District focus: Lowveld, Lubombo Plateau	Hlohlo, Lubombo	-
Tanzania	Implementation begun	Nationwide	Chunya, Iringa, Lake Victoria, Lushoto, Magu, Morogoro, Mpwapwa, Rufiji, Tunduru	Iringa rural, Iringa urban, Mtwara rural, Mtwara urban, Masasi, Tandahimba, Newala, Dar-es-Salaam – Temeke, Mwanza- Sengerema, Misungwi, Mbarali, Ngara, Kongwa, Mufindi, Kibondo, Lushoto, Pangani, Arusha municiplality, Kilosa, Muheza, Korogwe, Tanga municipality, Handeni, Morogoro rural, Rufiji, Magu, Mpwapwa, Igunga, Zanzibar - South, and North A and Pemba - Micheweni
Zambia	Implementation begun	Nationwide	Chibombo, Chingola, Chipata, Chongwe, Isoka, Kalomo, Kaputa, Mwinilunga, Samfya, Senanga	Lusaka, Kafuwe, Chongwe, Luwanga, Kitwe, Chingola, Chililambombwe, Kasma, Kabwe, Masaiti, Mpongwe, Mongu
Zimbabwe	Implementation begun	Binga, Kariba, Nyanga, Mutasa, Gokwe, Guruve, Hwange, UMP, Mudzi, Centenary	Binga, Bulilimamangwe, Centenary, Chipinge, Gokwe, Guruve, Hurungwe, Hwange, Kariba, Lupane, Mount Darwin, Mudzi, Mutasa, Nyanga, Uzumba-Maramba Pfungwe (UMP)	Hwange, Chipinge, Zaka Chegutu, Gokwe North, Mt Darwin



Baseline Survey Districts

9. LONG-TERM TRENDS IN MALARIA MORBIDITY AND MORTALITY

Time-series data to show long-term trends in reported malaria morbidity and mortality are available in Southern Africa. The reliability of such data varies by country. For some countries the coverage of the routine information system that captures such data has improved over time, such as in Botswana, South Africa, Swaziland and Zimbabwe. For other countries the coverage of the routine information system has fluctuated and in some cases collapsed for certain periods.

In addition to changing routine information systems, other factors need to be considered when interpreting the graphs:

- Population growth is not factored in as cases rather than incidence rates are given.
- Case definitions of malaria may have changed over time. For example, in the 1960s and 70s, only confirmed malaria cases were captured by some routine information systems (e.g. Malawi).
- When reported cases are clinical malaria cases, the changing epidemiology of other diseases (as well as changing malaria case definitions) may influence the trends. An example is HIV/AIDS which is likely to have caused a rise in non-specific fevers that have been misdiagnosed as clinical malaria.

Botswana, South Africa and Swaziland – which probably have the most robust time-series data – show a rising, albeit fluctuating, trend in reported malaria cases since the 1960s to the present day (Figure 9.1). For Zambia and Zimbabwe (Figure 9.2), the data indicate that malaria morbidity has risen steadily over time. However, marked improvements (or fluctuations) in coverage of the routine information systems make firm conclusions difficult. For Namibia (Figure 9.3) available data

suggests in the 1990s malaria morbidity has remained relatively constant. For the remaining countries – Angola, Malawi, Mozambique, Tanzania – the quality of the available data means it is not possible to make any meaningful interpretation.

Figure. 9.1. Reported Annual Malaria Cases in Botswana, South Africa and Swaziland, 1962-1999

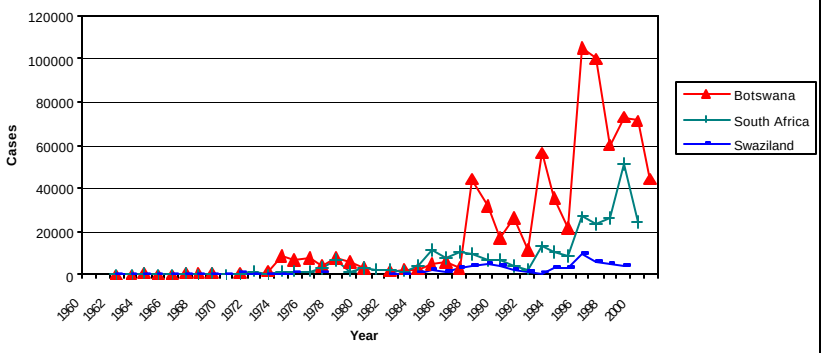


Figure 9.2. Reported Annual Malaria Cases in Namibia, Zambia and Zimbabwe, 1976-2001

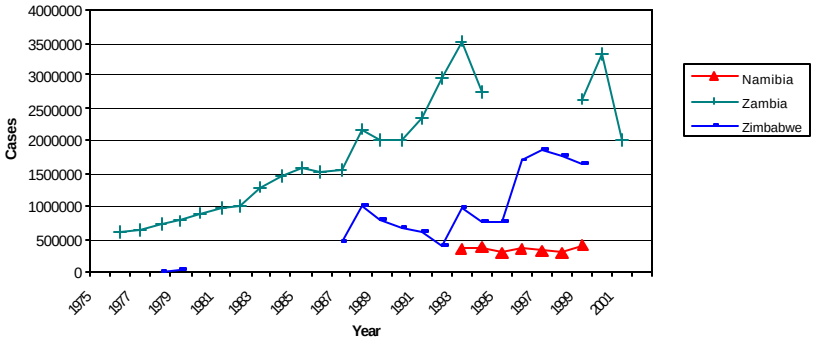


Figure 9.3. Reported Annual Malaria Cases in Angola, Malawi, Mozambique and Tanzania, 1962-1999

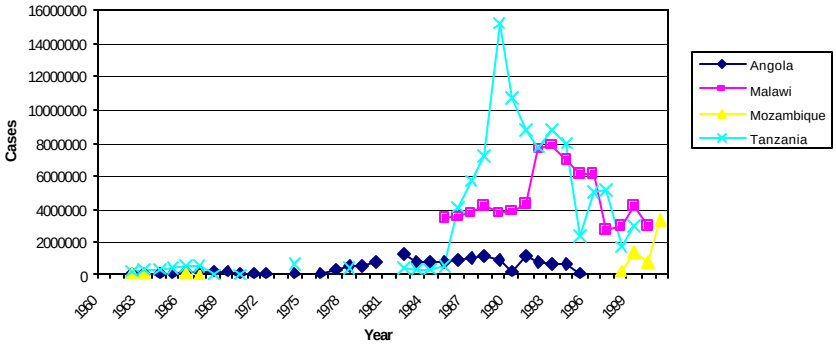


Figure 9.4 uses the same data as in Figure 9.1 but smoothes it with a 3 year moving average. This serves to remove annual fluctuations from the time-series and make it

easier to identify long-term trends. For the three countries, reported malaria morbidity has been rising. However, there is recent evidence that malaria morbidity may be declining. Recent reports from the NMCPs of Botswana and South Africa indicate a decline in malaria cases over the last one to two transmission seasons. In South Africa's case this may be associated with changes in drug policy and high coverage of IRS using DDT in Kwazulu-Natal.

Fig 9.4. Reported Annual Malaria Cases Smoothed (3 Year Moving Average), Botswana, South Africa and Swaziland, 1972-1999

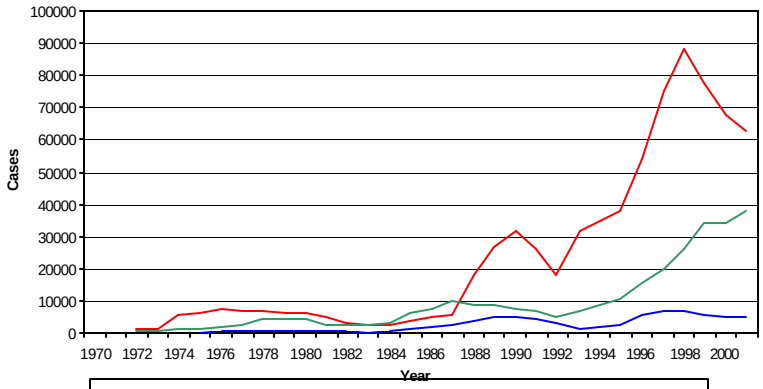
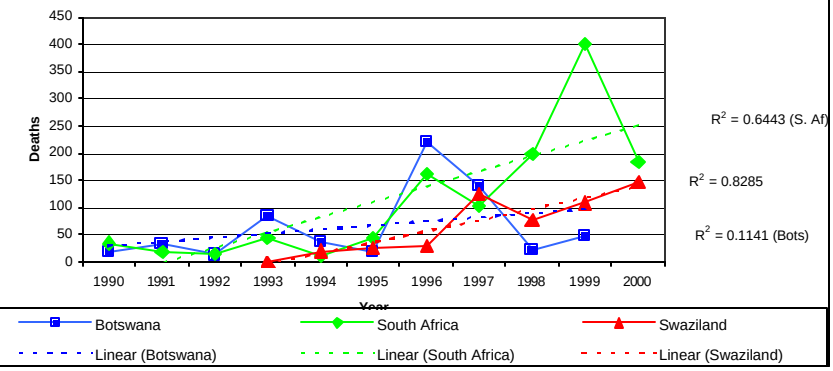


Figure 9.5 presents time-series data on reported malaria deaths from 1990 to 2000 for Botswana, South Africa and Swaziland. For each time series, a linear trend line has been fitted. The R-squared values show how well the estimated values for the trend line correspond to the time-series data. In other words, for Swaziland the trend line predicts 83% of the variation in the actual time series. For Botswana, there is no evidence of a rise in reported malaria mortality. However, for Swaziland and South Africa there is some. For South Africa, this may in part be due to drug failure in the late 1990s. For the last transmission season (2001) reported malaria deaths fell again. This has been attributed to the introduction of combination therapy (artemether-lumefantrine) in Kwazula-Natal.

Figure 9.5. Annual Malaria Deaths, 1990-2000, Botswana, South Africa and Swaziland



For the remaining countries (Figures 9.6. and 9.7), the available data make interpretation of malaria mortality trends difficult. For Mozambique, the rise in reported deaths is almost certainly due to improvements in the routine information

system. Likewise, changes in the routine information systems in Malawi and Zambia mean the time-series reveal very little. For Zimbabwe – data available????

Fig. 9.6. Annual Malaria Deaths, 1990-2001, Mozambique and Namibia

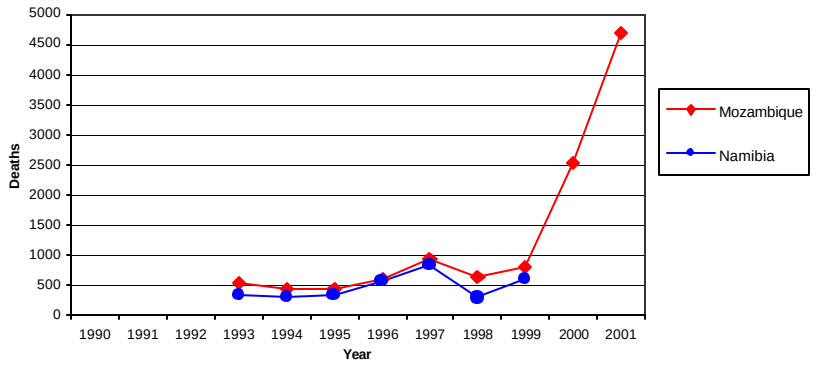
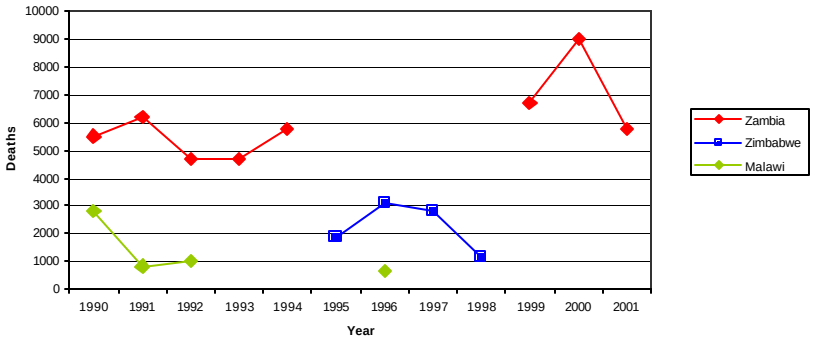


Fig. 9.7. Annual Malaria Deaths, 1990-2001, Malawi, Zambia and Zimbabwe



Despite the variability in the quality of data for Southern Africa, there are indications that the burden of malaria has risen in the last few decades. Health systems under stress, drug failure, a decline in the coverage and quality of vector control are likely to have all contributed. Recently, anecdotal reports from Namibia, Swaziland and Zimbabwe suggest HIV/AIDS is complicating the management of malaria and leading to a rise in malaria mortality.

However, the countries in the subregion are beginning to show success in reversing this trend. South Africa and Botswana have successfully reduced malaria mortality for the last two transmission seasons. Elsewhere the Roll Back Malaria partnership is increasing investment in malaria control. What is needed now is to strengthen delivery systems and the human capacity of malaria control programmes at the national and district levels in order for countries to be able to rapidly scale up interventions and make an impact on burden of malaria in Southern Africa.

REFERENCES

The document has been prepared largely by extracting data from a series of national malaria databases that countries have established with the help of SAMC over the last 12 months. In addition, data have been drawn from the SAMC inter-country databases and the recent RBM surveys.

Botswana National Malaria Database, Version 1.1
Demographic and Health Surveys, Macro International
Evaluation of Accelerated Malaria Control Programme 1998, Malawi, NMCP
Malawi National Malaria Database, Version 1.1
SAMC epidemic database
SAMC malaria burden and malaria routine information database
Swaziland National Malaria Database, Version 1.0
Swaziland Roll Back Malaria Baseline Survey, 2001, NMCP
Tanzania Roll Back Malaria Baseline Survey, 2001, NMCP
Zambia National Malaria Database, Version 1.1
Zambia Roll Back Malaria Baseline Survey, 2001, NMCP
Zimbabwe Roll Back Malaria Baseline Survey, 2001, NMCP