2) The total malaria cases of these villages during the month that they were problem priority villages were obtained from the regional supervisor.

3) The latest total malaria cases of these villages were obtained from the regional supervisor again.

4) Mass Blood Surveys (MBS) were done in these villages after the most recent monthly malaria cases were obtained.

5) The slide positivity rate (SPR) of the MBS were calculated for each village and compared with their most recent malaria cases and that when they were problem priority villages .

6) The villages were monitored and MBS were repeated when they experience another epidemic. The SPR was calculated and compared with that when they were not priority villages.

2.3. Analyzing both meteorology and malaria data to develop a system that could assist malaria officers in predicting epidemics and forecasting malaria cases. Hence responding in time, while waiting for malaria data to arrive from the clinics.

2.3.1. Collection of climate and malaria data

- *Collection of climate data*

Monthly data for rainfall, temperature, Atmospheric pressure and humidity were collected from the Meteorology Department in Honiara. Some data were also collected from the Meteorology office at Auki, Malaita province.

- *Collection of malaria case details*

Malaria records of the study areas are collected from the Vector Borne Disease Control Programme (VBDCP) regional officers responsible for the study areas. The data collected were the monthly records of villages, date, malaria cases, infant cases,

- *Correlating climate and malaria data*

1) For a selected year, each month`s meteorology data was summed and a line graph made. This was compared with the line graph of each of the malaria indicators of the same year. The malaria indicators were compared against each of the meteorology data were: total malaria cases, malaria infant rate and total infant cases, malaria incidence and malaria slide positive rate.

2) Any meteorology parameter that showed more correlation with any malaria indicator was selected. The correlation was repeated for the other years.

3. RESULTS

3.1. . DETERMINING THE COST –EFFECTIVE STRATEGY, PRO-ACTION or PASSIVE ACTION - TETERE REGION RESULTS

3.1.1. Problem villages

The whole of Tetere region is divided into four zones (Zone 5, 4,3, 2,1) with a total of more than 400 villages. This study was done only in Zone 4 to reduce the number of villages. The study covers the period between 2005 – 2007.

A total of 357 problem villages in zone 4 were monitored. Each month total malaria cases were collected and priority villages identified. In 2005 a total of 3,263 cases appeared in zone 4. From the 357 villages 94 villages did not have malaria cases. A total of 56 villages were identified as priority villages (because they have appeared more than once as a priority village) contributing 2,495 cases (76.5% of all cases).

In 2006 the 357 villages contributed 1,987 cases. A total of 48 villages were priority villages contributing 1538 cases (77.4% of all cases), see table 1.

Table 1: Problem villages and priority villages

YEAR	PROBLEM VILLAGES	TOTAL CASES	PRIORITY VILLAGES	PRIORITY VILLAGES CASES
2005	357	3,263	56	2,495
2006	357	1,987	48	1,538

3.1.2. Priority villages

Priority villages are highest malarious villages within a selected time-period, that when their cases are added would total up to or near to 50% (could be slightly less or slightly more)of that period's total cases. Therefore a priority village is a village of that group.

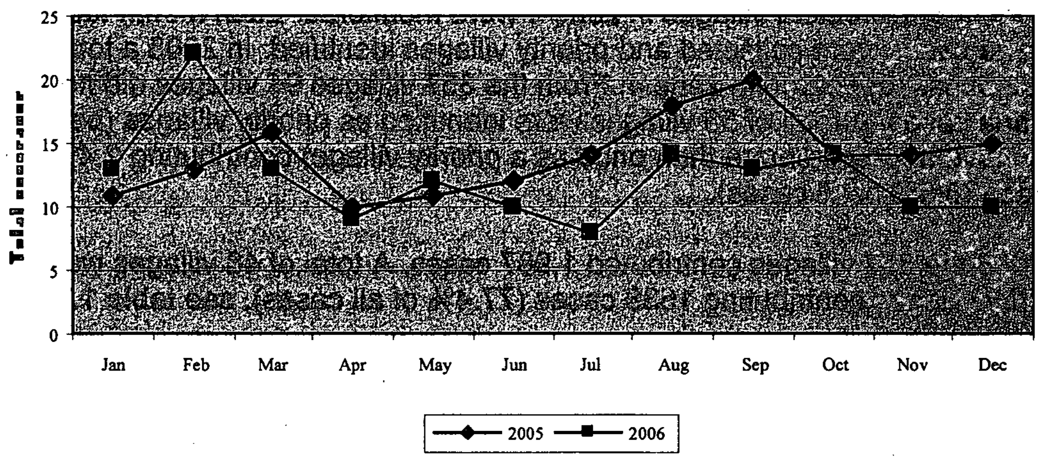
Total villages appearing as priority villages each month in 2005 are not the same. The same is also seen in 2006 (see table 2). This is an indication that priority villages do not always remain priority villages in each month. In other months there is an increase in priority villages and in others a decrease.

Table 2: Frequency of villages appearing as priority villages

YEAR	Number of villages appearing as priority villages per month											
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
2005	11	13	16	10	11	12	14	18	20	14	14	15
2006	13	22	13	9	12	10	8	14	13	14	10	10

However the general annual trend is that there are more priority villages in the periods: February-March and August-October (see Table 2 and fig. 3)

Fig. 3: Number of villages appearing as PRIORITY VILLAGES



3.1.3. Priority villages and malaria peak periods

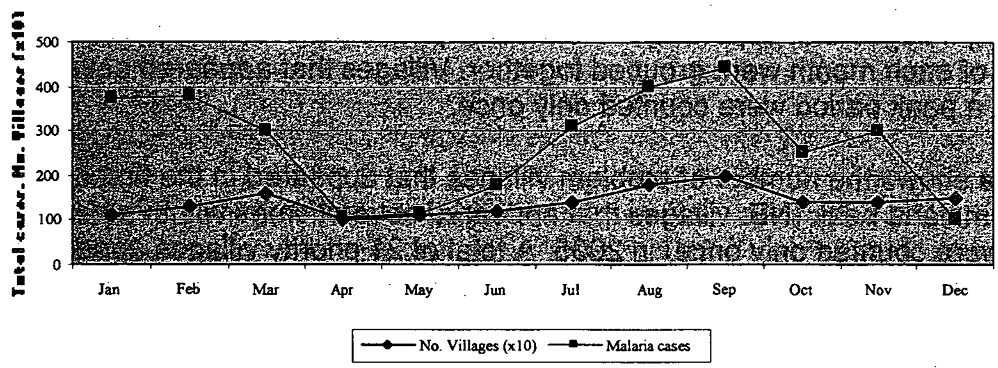
The number of priority villages per month was correlated with its respective monthly malaria cases. Table 3 and fig 4 showed that the trend of the priority villages per month when compared with their respective malaria cases in 2005 showed a positive correlation

Table 3: Number of priority villages/month and monthly cases - 2005

	Monthly total cases												
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	**TOTAL**
Cases	374	379	301	107	115	182	310	396	444	253	299	101	**3,261**
Priority villages	11	13	16	10	11	12	14	18	20	14	14	15	**168**

Fig.4 shows that the number of priority villages correlates with the malaria trend - 2005.

Fig.4: THE MONTHLY NUMBER OF PRIORITY VILLAGES AND MONTHLY MALARIA CASES - 2005



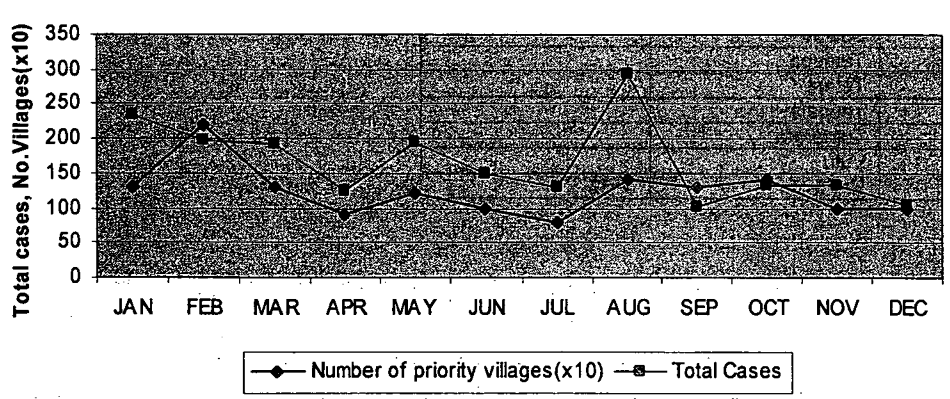
In 2006, the trend of the priority villages per month compared with their respective malaria cases also showed a positive correlation (see table 4 and fig. 5).

Table 4: Number of priority villages/month and total monthly cases - 2006

		JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Number of priority villages(x10)		13	22	13	9	12	10	8	14	13	14	10	10
Total Cases		233	198	192	123	195	151	131	294	101	132	132	105

Fig.5 shows that the number of priority villages correlates with the malaria trend -2006

MONTHLY FREQUENCY OF PRIORITY VILLAGES AND MONTHLY MALARIA CASES - 2006



NB: The priority village graph is increased by X10 for a better view.

In the malaria peak periods the number of priority villages also increase

3.1.4. Identifying villages appearing at the peak periods

All priority villages that appeared in the malaria peaks were recorded. The priority villages of each month were grouped together. Villages that appeared several times in a peak period were counted only once.

Table 5a shows the number of problem villages that appeared in the first and second malaria peak (NB: villages that appeared several times within a peak period were counted only once) in 2005. A total of 21 priority villages appeared in the first peak and 28 in the second peak. The table also shows 12 villages (57.1%) that appeared in the first peak appeared again in the second peak.

Table 5a: **PROIRITY VILLAGES APPEARING AT THE PEAK PERIODS OF 2005**

FEB-MARCH	AUG-SEPT	SAME VILLAGES
Begotathi	Balasuna	Binu
Binu	Bebe	Dadare
Dadare	Binu	Foxwood
Foxwood	Bubuli	Kapinaora
Grove	Califonia	Komukama
Kalobala	CDC1	Metapona
Kapinaora	CDC2	Nguria
Koleasi	Dadare	Roghrolo
Kolona	Foxwood	Sali
Komukama	Ghorabau	Soso
Kopinaoru	Keamami	Suaghi
Kore	Komukam	Tetere
Maragho	Komuporo	
Metapona	Komuraolo	
Nguria	Kopinaora	
Roghrolo	Metapona	
Sali	Mutaga	
Soso	Nguria	
Suaghi	Rarata	
Tavughi	Sali	
Tetere	Sopapera	
	Soso	
	Suaghi	
	Teatupa	
	Tetere	
	Tuepala	
	Tumarora	
	Vutu	
N=21	**N=28**	**N=12**

In the first peak in 2005 the priority villages in February were found to have more than 10 cases. The priority villages in March were found to have more than 6 cases. The priority cut-off points were 10 and 6 cases. Because February and March were of one peak period the priority villages in the months were grouped as one and the cut-off point for priority villages started from the lowest cut-off point, 6 cases. Hence if February and March will have a common cut-off point which is 6 cases (the lowest cut-off case in March) then the number of priorities for February will increase. See table 5b.

Table 5b: **PROIRITY VILLAGES APPEARING AT THE PEAK PERIODS OF 2005**		
FEB-MARCH	AUG-SEPT	SAME VILLAGES
Begotathi	Balasuna	Binu
Binu	Bebe	Dadare
Dadare	Binu	Foxwood
Foxwood	Bubuli	Kapinaora
Grove	Califonia	Komukama
Kalobala	CDC1	Metapona
Kapinaora	CDC2	Nguria
Koleasi	Dadare	Roghrolo
Kolona	Foxwood	Sali
Komukama	Ghorabau	Soso
Kopinaoru	Keamami	Suaghi
Kore	Komukam	Tetere
Maragho	Komuporo	
Metapona	Komuraolo	Balasuna
Nguria	Kopinaora	CDC2
Roghrolo	Metapona	Ghorobau
Sali	Mutaga	Teatupa
Soso	Nguria	Tumurora
Suaghi	Rarata	
Tavughi	Sali	
Tetere	Sopapera	
	Soso	
Babani	Suaghi	
Balasuna	Teatupa	
CDC2	Tetere	
Ghorobau	Tuepala	
Teatupe	Tumarora	
Tumurora	Vutu	
N=27	**N=28**	N=17

When the priority villages in February and March were selected from one common cut-off point (6 cases) the total priority villages increased to 27 and the number of same villages appearing again in the second peak period increased to 17 (63%) see table 5b. Therefore if the months in the first peak period are combined and the lowest cut-off point in any of the months is selected as a common cut-off point the proportion of the villages in the first peak that appears again in the second peak will increase to 63%.

In 2006, the first malaria peak period was January-March and August (Fig 6). In the peak period January-March there was a total of 23 villages that contributed to the total malaria cases. In the second malaria peak in August there were 18 villages. Of the 18 villages that appeared on August 13 villages (56.5%) were the same ones from the first peak in January-March (see table 6).

Table 6: **PRIORITY VILLAGES APPEARING AT THE PEAK PERIODS OF 2006**		
JAN-MARCH	AUG	SAME VILLAGES
Babani	Balasuna	Balasuna
Balasuna	Barande	CDC2
Bebe	CDC2	Foxwood
Binu	Foxwood	Kaotare
Bubulu	Kaotare	Komuraolu
CDC2	Komuraolu	Metapona
Dadare	Mataga	Roghrolo
Foxwood	Metapona	Sali
Kaotare	Ngalibiu	Sopapera
Koli	Nguria Sch.	Suaghi
Komukam	Rarata	Teatupe
Kopinaora	Roghrolo	Tumurora
Kumuraolo	Sali	Vutu
Metapona	Sopapera	
Sali	Suaghi	
Soso	Teatupe	
Sopapera	Tumurora	
Suaghi	Vutu	
Teatupe		
Tetere		
Tuebala		
Tumurora		
Vutu		
N=23	N=18	N=13

In 2006 the months in the first peak period were combined and the lowest cut-off point in any of the months was selected as a common cut-off point. The cut-off point was 5 cases which is the same cut-off point in the other months. Hence the number of villages in the first peak that appeared again in the second peak remained the same at 13 villages (56.5%). These villages made up 72.2% of all the priority villages in the second peak.

To predict the possible problem villages that would appear in the first malaria peak, at the beginning of the year, the priority problem villages in the malaria peak of the last quarter of the year in 2005 were checked against the priority villages of the first malaria peak in 2006 (see table 7)

Table 7: **PROIRITY VILLAGES APPEARING AT THE AUGUST – SEPTEMBER PEAK PERIODS OF 2005 AND JANUARY-MARCH 2006**		
AUG-SEPT 2005	JAN-MARCH 2006	SAME VILLAGES
Balasuna	Babani	Balasuna
Bebe	Balasuna	Bebe
Binu	Bebe	Binu
Bubuli	Binu	CDC2
Califonia	Bubulu	Dadare
CDC1	CDC2	Foxwood
CDC2	Dadare	Komukam
Dadare	Foxwood	Komuraolo
Foxwood	Kaotare	Kopinaora

Ghorabau	Koli	Metapona
Keamami	Komukam	Sali
Komukam	Kopinaora	Sopapera
Komuporo	Kumuraolo	Soso
Komuraolo	Metapona	Suaghi
Kopinaora	Sali	Teatupa
Metapona	Soso	Tetere
Mutaga	Sopapera	Tuepala
Nguria	Suaghi	Tumarora
Rarata	Teatupe	Vutu
Sali	Tetere	
Sopapera	Tuebala	
Soso	Tumurora	
Suaghi	Vutu	
Teatupa		
Tetere		
Tuepala		
Tumarora		
Vutu		
N=28	**N=23**	N=19

Table 7 shows that 19 (67.9%) of the villages that appeared in the last peak in 2005 also appeared in the first peak in 2006.

3.1.5. Top priority villages and their appearances in the peak periods

Selecting top priority villages is a quest to perfect the chances of predicting the possible problem village that would appear in the first peak period of the year.

In 2005 the top priority villages that appeared > 6 times as priority villages were 8 (see table 8). In the first peak of 2006 (January-March) 100% of all these top priority villages appeared as priority villages (see table 8). These top priority villages contributed 24.1% of the total malaria cases of the first peak period.

Table 8: Top priority villages appearing >6 times

2005 Top priority villages appearing >6 times	Cases	2006 1st peak period priority villages	Total Malaria cases in peak period for top priority villages that appeared again
Binu	69	Babani	
Foxwood	73	Balasuna	
Komukama	96	Bebe	
Sali	136	Binu	10
Sopapera	64	Bubuli	
Soso	119	CDC2	
Suaghi	229	Dadare	
Teatupe	73	Foxwood	23
		Kaotare	
		Koli	
		Komukam	11
		Kopinaora	
		Kumuraolo	
		Metapona	

		Sali	14
		Soso	16
		Sopapera	15
		Suaghi	53
		Teatupe	8
		Tetere	
		Tuebala	
		Tumurora	
		Vutu	
TOTAL	859		150
Contribution (%) to 3,262	26.3%	Contribution(%) to 623 cases in peak period	24.1%

When the number of appearances of the top priority villages was reduced to > 5 times, total top priority villages increased to11. In the first malaria peak in 2006 (Jan-March) 91% of these top priority villages appeared as priority villages (see table 9). These top priority villages contributed 32.6% of all cases in the first peak period.

Table 9: Top priority villages appearing >5 times

2005 Top priority villages appearing >5 times	Cases in 2005	2006 1st peak period priority villages	Malaria cases in peak period for top priority villages that appeared again
Binu	77	Babani	
Foxwood	73	Balasuna	
Kumukama	96	Bebe	
Komuraolu	57	Binu	10
Metapona	69	Bubuli	
Roghrolo/Rogavolo	60	CDC2	
Sali	136	Dadare	
Sopapera	67	Foxwood	23
Soso	119	Kaotare	
Suaghi	229	Koli	
Teatupe	73	Komukam	11
		Kopinaora	
		Kumuraolo	14
		Metapona	20
		Sali	14
		Soso	16
		Sopapera	15
		Suaghi	53
		Teatupe	8
		Tetere	
		Tuebala	
		Tumurora	

		Vutu	
TOTAL	1056		184
Contribution (%) to annual total of 3,262 cases	32.4%	Contribution (%) to total 623 cases in peak period	29.5%

When the number of appearances of top priority villages was reduced to > 4 times the number of top priority villages increased to 16. In the first malaria peak in 2006 (Jan-March) 62.5% of the top priority villages appeared as priority villages (see table 10). These priority villages contributed 31.6% of cases in the peak period.

Table 10: Top priority villages appearing >4 times

2005 Top priority villages appearing >4 times	Malaria case	2006 1st peak period priority villages	Total Malaria cases in peak period for top priority villages that appeared again
Begotathi	65	Babani	
Binu	77	Balasuna	
Foxwood	73	Bebe	
Ghorabau	61	Binu	10
Kapinaora	45	Bubuli	
Komuraolu	57	CDC2	
Kumukama	96	Dadare	
Metapona	69	Foxwood	23
Roghrolo/Rogavolo	60	Kaotare	
Sali	136	Koli	
Sopapera	67	Komukam	
Suaghi	229	Kopinaora	
Soso	119	Komuraolo	14
Teatupe	73	Metapona	20
Tetere	55	Sali	14
Vutu	60	Soso	16
		Sopapera	15
		Suaghi	53
		Teatupe	
		Tetere	14
		Tuebala	
		Tumurora	
		Vutu	18
TOTAL	1,342		197
Contribution (%) to annual 3,262 cases	41.1%%	Contribution (%) to 623 cases in peak period	31.6%

3.1.6. Months of appearances of priority villages

Table 11 shows that only a small proportion of villages that appeared as priority villages in a certain month in 2005 did reappear as priority villages in the same month in 2006. The highest proportion of villages that appeared as priority villages on the same months occurred in two periods: February-March (11.1-9.50%) and August-October (12.7%). These are malaria peak periods also.

Table 11 : Number of priority villages appearing on the same months in 2005-2006

MONTH	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Villages	4	7	6	2	2	2	5	8	8	8	5	3
No.village/total villages (%)	6.30	11.1	9.50	3.20	3.20	3.20	7.90	12.70	12.70	12.70	7.90	4.80

The peak periods in 2006 may have appeared in different months compared to that in 2005. Thus the problem villages in 2005 could not appear in the same months in 2006. Therefore we cannot predict exactly the month the priority villages would appear based on last year`s record. However the villages that appeared again in the same month as of last year 83% were top priority villages (Table 12).

Table 12: Number of top priority villages appearing on the same months

Villages appearing on the same month	4	7	6	2	2	2	5	8	8	8	5	3	Total = 60
Top Priority villages appeared on the same month (>4X)	2	5	5	2	2	2	4	7	6	7	5	3	Total = 50

3.2. DETERMINE IF THE PRESENT PASSIVE-ACTION STRATEGY IS EFFECTIVE - TETERE REGION RESULTS

Now that we could predict which problem villages would appear in the epidemic period this section is to determine the longevity of effectiveness of the control measures applied. By knowing the longevity of the impact of an applied control measure we could determine when a pro-action activity should be applied.

There are three methods used for measuring the effectives of these control measures:

a) the pre-data and post-data of villages that had control measures were compared.

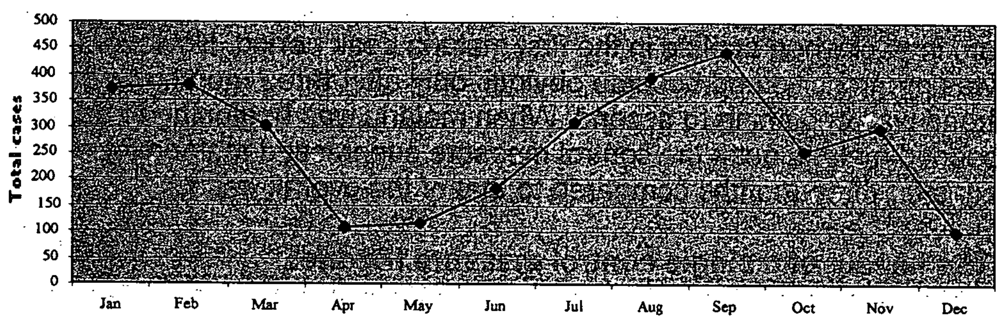
b) malaria trend of the whole region is compared with the malaria trend of villages that had control measures.

c) the impact of different malaria control measures.

3.2.1. COMPARING THE MALARIA TREND OF TETERE REGION WITH THAT OF VILLAGES WITH CONTROL MEASURES (test villages)

In 2005 a total of 306 villages in Tetere region were monitored. Monthly cases of these villages were tabulated. Figure 6 is the malaria pattern of Tetere region. This will be used as a standard and will be compared with the malaria pattern of the test villages.

Fig. 6: Overall malaria trend of Zone 4 (306 villages) of Tetere Region on Guadalcanal -2005



3.2.1.1.The impact of a single control measure (Bednet distribution/replacement) applied at the first malaria peak period of the year.

Some villages in which a single control measure was done were attended in March, in the first malaria peak period of the year. They were monitored until October only. The figures were small compared to the Tetere region (overall) figures, hence they were multiplied by a factor (x 5.1) to extrapolate the figure so that graphically comparisons could be easily done (table 13 and figure 7).

Table 13: Overall malaria cases and total cases of villages(n=9) with single activities (BR) done in March 2005.

VILLAGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT

306 villages (Total cases)	374	379	303	107	115	182	310	396	444	253
Test villages (n=9) with 1 control measure	62	65	61	41	19	28	50	94	76	65
Test villages(n=9) cases x 5.1	311.1	331.5	311.1	209.1	96.9	142.8	255	479.4	387.6	331.5

NB: Factor = Total cases of Tetere/total cases of test villages

Fig. 7: Overall malaria trend and trend of test villages (n=9) with a single control measure (BR)

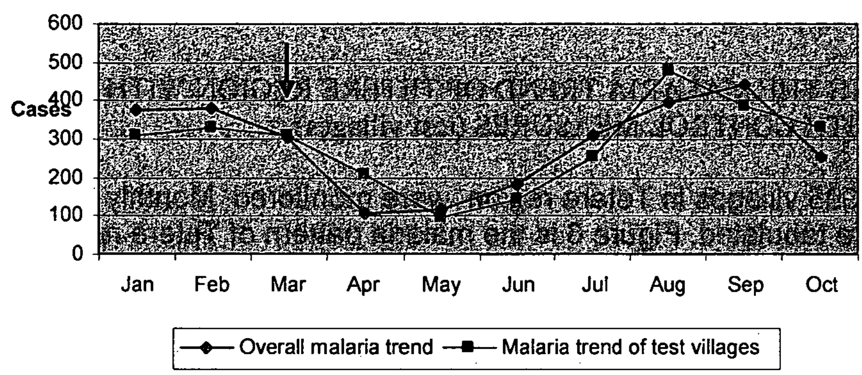


Figure 7 shows that a single control measure (Bednet) did not have an immediate impact when applied in the first malaria peak period. However the impact was progressive and became obvious only after three months when the overall trend was beginning to ascend. When malaria was beginning to ascend for the second malaria peak the control measure suppressed malaria lower in the test villages for three months compared to that of the overall trend.

3.2.1.2.The impact of a single control measure (Bednet distribution/replacement) applied at the lowest malaria period of the year .

The lowest malaria period in Tetere region in 2005 is April-June. Three villages were attended with a single control measure (Bednet distribution/replacement) on this period (June). They were monitored monthly, recording malaria cases until December. The records are presented in Table 14 and figure 8.

The monthly record of the test villages were compared with the figures of the whole of Tetere region(overall).The figures of the test villages were small against the overall figures of Tetere region thus they were extrapolated by a factor of 14.3 to make graphical comparisons easier.

Table 14: Overall malarai trend and trend of villages(n=3) with single activities (BR) done in June 2005.

VILLAGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
306 villages (Total cases)	374	379	303	107	115	182	310	396	444	253	299	101

Test villages (n=3) with 1 control measure	29	40	17	13	10	10	14	34	35	8	11	7
Test villages(n=3) cases x14.3	415	572.5	243.3	186	143.1	143.1	200.3	486.6	500.9	114.5	157.4	100.2

NB: Factor = Total cases of Tetere/total cases of test villages

Figue 8: Overall malaria trend and trend of test villages (n=3)with single activity(BR) done in June 2005

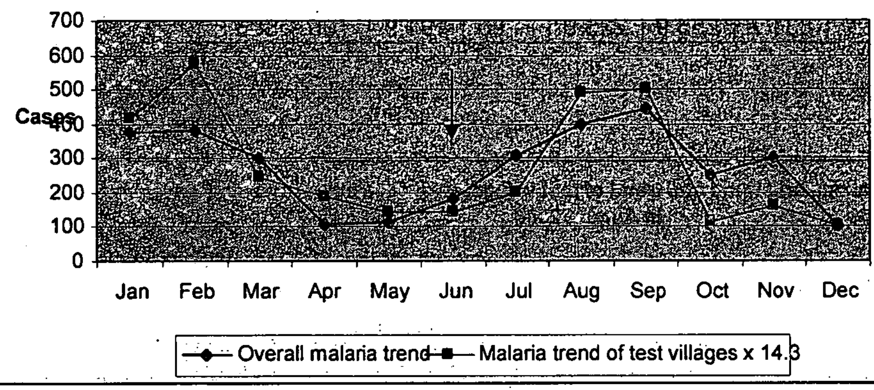


Figure 8 shows that when a single malaria control measure is applied just before the malaria trend starts to ascend it could suppress malaria lower, immediately for two months. However this suppression did not continue to the height of the second malaria peak period (August –September). Only when the second malaria peak of the year starts to descend thus the impact is obvious again, cases are lower than that of the Tetere region pattern.

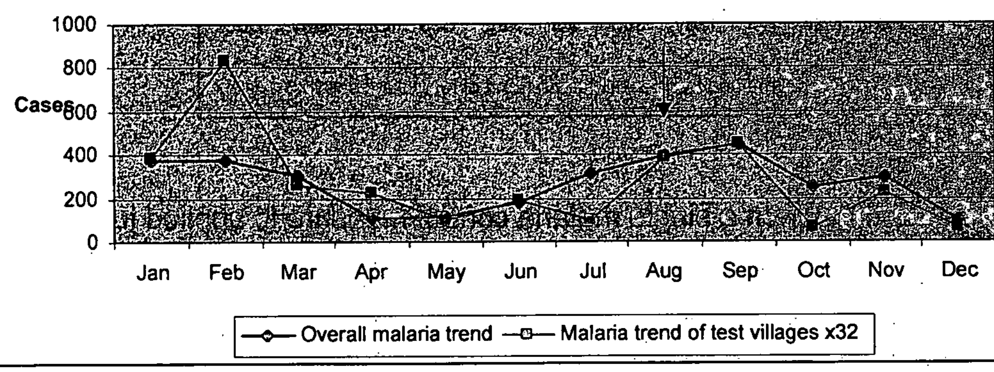
A single control measure applied prior to the beginning of a malaria peak could suppress malaria but only for two months. In the malaria peak period the impact is not obvious until the peak starts to descend again.

3.2.1.3.The impact of a single control measure (Bednet distribution/replacement) applied at the second malaria peak period (August) of the year .

The height of the second peak period in 2005 occurred in August-September. Two priority villages were attended in August with a single control measure (Bednet distribution/replacement). Their monthly malaria cases is compared with the overall malaria trend of Tetere region as shown in Table 15 and figure 9.

Table 15: Overall malaria trend and trend of villages(n=2) with single activities (BR) done in August 2005.												
VILLAGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
306 villages (Total cases)	374	379	303	107	115	182	310	396	444	253	299	101
Test villages (n=2) with 1 control measure	12	26	8	7	3	6	3	12	14	2	7	2
Test villages(n=2) cases x32	383.9	831.7	255.9	223.9	96	191.9	96	383.9	447.9	64	223.9	64

Fig. 9: Overall malaria trend and trend of test village(n=2)with a single activity (BR) in August 2005



The results show that during the peak period malaria cases would still show an increase, thus no obvious reduction in malaria. However the reduction of malaria becomes more obvious two months later, when the malaria peak begins to descend.

3.2.1.4.The impact of a double control measure (Residual spraying and Bednet distribution/replacement) applied at the second malaria peak period (August) of the year .

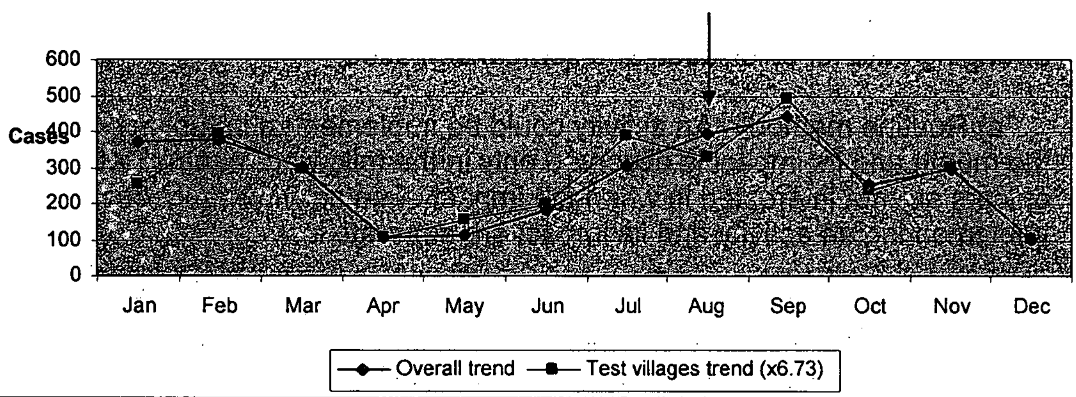
In August, at the height of the malaria peak (August-September) in 2005, two control measures: Residual spraying (RS) and Bednet distribution/replacement (BR)) were applied in six villages. The insecticide that was used for residual spraying was Lamdacyhalothrin (ICON).

Monthly malaria cases were recorded and compared with the Tetere region (overall) trend as a standard. Results are summed in Table 16 and figure 10.

Table 16: Overall malaria trend and trend of villages(n=6) with double activities (SA,BR) done in August 2005.

VILLAGES	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
306 villages (Total cases)	374	379	303	107	115	182	310	396	444	253	299	101
Test villages (n=6) with 2 control measures	**38**	**59**	**44**	**16**	**23**	**30**	**58**	**49**	**73**	**35**	**45**	**15**
Test villages(n=6) cases x 6.73	255.66	396.94	296.02	107.65	154.74	201.84	390.21	329.66	491.13	235.47	302.75	100.92

Fig. 10: Overall malaria trend and trend of test villages (n=6) with double activities(SA,BR) In August 2005



The result shows that two control measures: Residual Spraying and Bednets, do have an immediate impact, even when applied at the malaria peak period. Malaria was reduced significantly on the month of application, but could not sustain it for another month in the peak period.

3.3. DETERMINE IF THE PRESENT PASSIVE-ACTION STRATEGY IS EFFECTIVE - CENTRAL REGION RESULTS

Now that we could predict when the epidemic period problem villages could occur this section is to determine the longevity of effectiveness of the control measures applied in Central Region of Malaita province. By knowing how long the impacts of an applied control measure lasts we could determine when a pro-action activity could be applied.

There are three methods used for the measuring of the effectives of these control measures:

a) the pre-data and pos-data of villages that control measures were done were compared.

b) the malaria trend of the whole region is compared with malaria trend of the villages that control measures were done.

c) the impact of different malaria control measures – in Central Region of Malaita only Mass Blood Surveys with curative treatment of positive patients and Bednet replacements were done..

3.3.1. The impact of control measures (MBS and Bednet distribution/replacement) in problem villages .

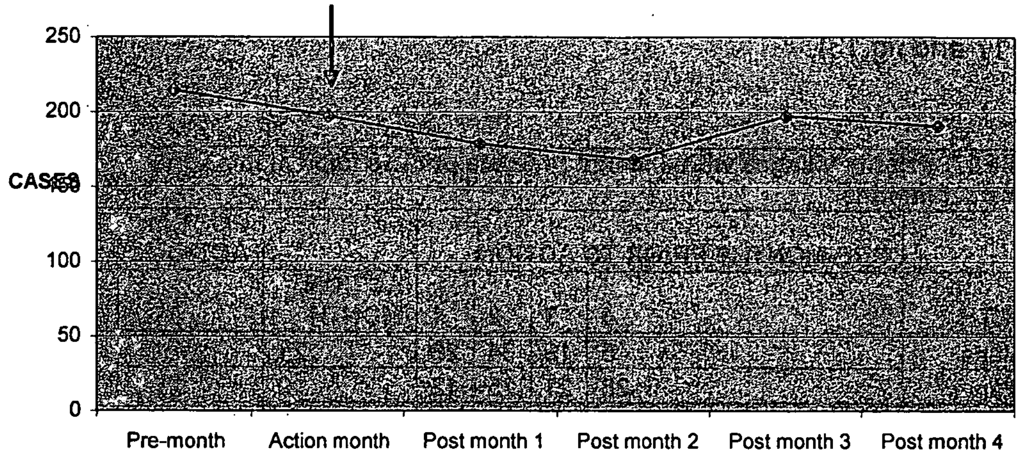
. To assess the impact of malaria control activities there are two methods of arranging data for calculation and comparison used:

a) Routine method – An activity could be implemented in the last week of the month and its impact is observed only in the following month. Field officers are not interested in when the impact of an activity would occur. Implementing an activity and its impact are separate issues.

b) Adjusted method – This method considers time of action and the period of its impact as one. Therefore if an activity is done in the last week of the month the next three weeks that fall in the following week is still considered as the month of action.

In 2006 a total of twenty villages were attended with MBS with BR. Using the routine method Fig 11 shows that the impact of MBS and BR is observed also on the immediate month of action. The impact of the activity lasted for another two months later.

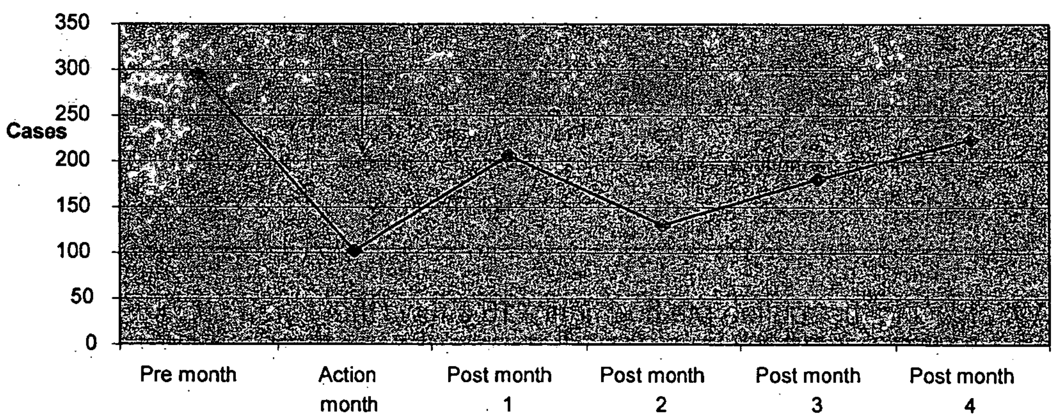
Fig 11: THE IMPACT OF CONTROL MEASURES IN MALARIA PROBLEM VILLAGES(n=20) - 2006



**Using routine method

Using the adjusted method of calculation on the same villages as shown in Fig:12 the impact of the control measures are more significant on the month action was done. However this was not sustained as malaria cases increased in the following month.

Fig. 12: THE IMPACT OF CONTROL ACTIVITIES (MB,BR) ON MALARIA PROBLEM -2006 VILLAGES (n=20)



NB: Using adjusted method

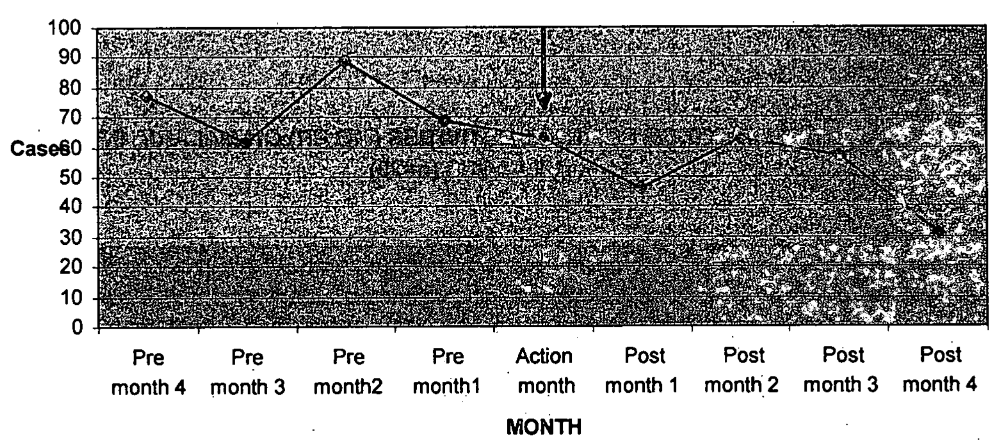
From the 20 villages attended in 2006 five priority villages were assessed. Malaria control activities were done in different months. Their data were arranged into Pre-month data, action month and post-month data (see table 17 and fig.13).

Table 17: Priority villages with 4 month pre-data prior to implementation of control measure and four post months

	PRE-MONTHS PRIOR TO ACTION					POST MONTHS AFTER ACTION			
MONTH	**4**	**3**	**2**	**1**	**ACTION MONTH**	**1**	**2**	**3**	**4**
Lilisiana	5	13	34	28	21	15	12	9	7
Lilisiana	28	21	15	12	9	7	9	9	0
Kelakwai	14	2	19	8	12	11	6	12	4
Kilusakwalo	27	2	10	7	4	5	4	9	10
Auki	3	24	11	14	17	8	32	18	10
TOTAL	**77**	**62**	**89**	**69**	**63**	**46**	**63**	**57**	**31**

*NB: Routine method was used

Fig. 13: Impact of malaria control activities in priority villages- 2006



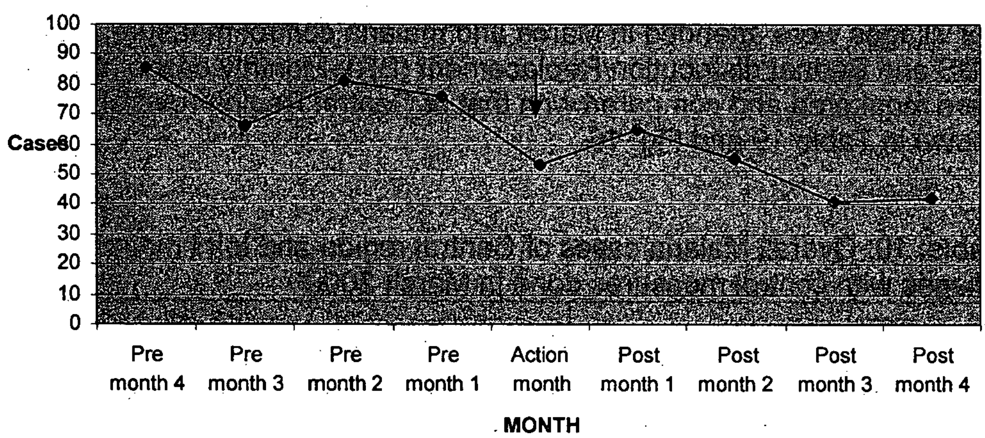
When using the routine method figure 13 shows that when attending a village using MBS and BR the impact is observed on the following month. However the reduction of malaria could not be sustained to the second month.

When using the adjusted method, Table 18 and Figure 14 shows that control activities (MBS and BR) do have a significant impact on the very month they were applied. However the impact could not be sustained. Malaria increased again on the following month.

Table 18: Priority villages with 4 month pre-data prior to implementation of control measure and four post months									
	PRE-MONTHS PRIOR TO ACTION					POST MONTHS AFTER ACTION			
MONTH	4	3	2	1	ACTION MONTH	1	2	3	4
Lilisiana	5	13	34	28	21	15	12	9	7
Lilisiana	28	21	15	12	9	7	9	9	0
Kelakwai	2	19	8	12	11	6	12	4	14
Kilusakwalo	27	2	10	7	4	5	4	9	10
Auki	24	11	14	17	8	32	18	10	11
TOTAL	**86**	**66**	**81**	**76**	**53**	**65**	**55**	**41**	**42**

**NB: adjusted method was used.

Fig. 14: Impact of malaria control activities on priority villages - 2006



3.3.2. The impact of double control measures at different periods of the year

The malaria pattern for Central region of Malaita is shown in Figure 15. A total of 126 villages were monitored in 2006 and their monthly data summed together to make the overall malaria pattern. This overall pattern is used as a standard for comparing with the malaria pattern of villages attended with malaria control measures.