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1.0 Executive Summary and Recommendations

2.0 C Survey

2.1 Background and Introduction

Lymphatic filariasis is a disease of the poor and endemic in 32 of the least-developed countries in the world with 11 countries in the Pacific region. Within the Pacific region 7.9 million people were at risk, 6.2 million are targeted for MDA and 500,000 people were infected. Those with the symptoms suffer physical disability, social stigma and loss of livelihood.

In 1998 studies carried out by malaria staffs throughout Vanuatu showed that LF still focally transmitted in many parts of the country with 4.79% infection rate (Vanuatu Department of Health). The mosquito *Anopheles farauti* were known as the vector and *Wuchereria bancrofti* as the parasite (Sasa, 1976). *Anopheles* mosquito ~~are~~ transmitting malaria which is endemic and still a major problem in the country. There are consistent transmission of parasites in areas of malaria transmission due to these vectors.

During the Palau meeting in 1997, 22 island countries in the Pacific agreed to join the global commitment to eliminate lymphatic filariasis by year 2010.

In 1998 Vanuatu National Lymphatic Filariasis Control Programme was established with two aims:

1. Eliminate filariasis in Vanuatu
2. Eliminate the risk of filariasis infection from the population by 2004 through mass treatment and vector control.

The control programme consists of 5 phases:

- Phase 1: Screening and Baseline Survey
- Phase 2: MDA for 5 years
- Phase 3: Survey for the impact of the MDAs
- Phase 4: Follow up survey on the positive cases and filariasis patients
- Phase 5: Survey of children under 5 years to see the present transmission within the community and vector control activity should be ongoing to stop transmission.

Vanuatu MDA was launched in year 2000 with 83% coverage. Since then it was sustained with above 80% coverage throughout the five rounds of MDA (Vanuatu Department of Health, 2004).

A mid-term evaluation was carried out in 2002 to look at the overall impact of the MDA programme after 2 years implementation. The outcome showed a reduction of 93% for microfilaraemia and 63% for

antigenaemia prevalence in comparison to baseline survey (Mid Term Evaluation, 2002).

A year after
After a year of the fifth MDA (August 2005) C survey took place through out the country. *explain* *PacELF*

This survey was carried out in order to assess the impact of Mass Drug Administrations on the filariasis prevalence in the population and to monitor the progress of the elimination programme. *determine whether < 1%*

With the objectives of:

- To compare the prevalence of antigenaemia in the population to the Mid term Evaluation after the 2nd round of the MDAs and the baseline levels measured before the start of the MDA campaign. This survey will be conducted by using ICT test kits and mf for positives ICT on estimation of 6515 people in 133 villages which was selected through the Random Cluster Sampling Modified Segment Design. *Then Super*
- To ascertain coverage and compliance, perceptions regarding the programme and knowledge of filariasis in the community.
- To report on coverage of drugs distributed for the whole country.
- To assist in determining the best serological assays to use and the best age-group to test for future evaluation surveys.

Subsidiary Objectives:

- To assess the impact of bed net use on the filariasis eradication programme.
- Strengthening the Morbidity Cases management, recording and follow up cases.

2.2 Methods

This Preparation of the materials *was* were done by the national team, include coding of registration books, printing of 1000 *KAP* study questionnaires, morbidity chart, pre-pack of Morbidity kits for the symptomatic cases (consist of soap, antiseptic cream and towel) to be distributed during the survey to the filariasis patients to assist them in keeping clean the affected part and explain the exercised method, what should be done or shouldn't be done during the acute attack and foremost how to look after the affected area by using the provided kits. *day*

A total of 10,000 ICT test cards were allocated for this survey by PacELF office, along with that James Cook University (JCU) supplied the filter paper for blood collection for antigen-antibody test and national office supplied the plastic bag for packing of the filter paper and sent it to JCU. Filariasis drugs, DEC and Albendazole were packed for any positives of ICT shall be *who were*

treated after the collection of slide at night time between 10.00 to 12.00 o'clock. Slides and alcohol swaps and capillary tube were provided for mf collection and every slide ~~were~~^{was} read by two microscopists.

The estimated sample size needed was

C Survey selection of areas and villages were done with the assistance of Dr. Patricia Graves from Atlanta, USA by using the Random Cluster Sampling Modified Segment Design by UNICEF. Estimation of 6515 people in 133 villages ~~should be~~^{was} tested during this survey. Vanuatu 6 provinces was divided in to 3 strata base on the antigenaemia prevalence during the 1998 survey,

Within each stratum at least 30 clusters of 15 households each, selected using the UNICEF modified segment design. In this design, a 'segment' is defined as group of neighbouring households, in this case 15. A cluster consists of one segment. Clusters are selected with probability proportional to estimated population size (in segments).

The average household size in Vanuatu is five people. Thus the survey has a total of 90 clusters with about 75 people in each, for a total of about 6750 people (2250 per stratum).

with

30 clusters ~~should be~~^{was} chosen per stratum because this is the recommended number to achieve a reliable estimate of prevalence for the stratum. A cluster size of 20-25 households is usually recommended, in order to avoid having to divide villages into large numbers of segments. The cluster size of 15 households in this survey was chosen instead of a larger number for two reasons:

- 1) To keep the overall number of persons tested within reasonable limits
- 2) Because Vanuatu villages are quite small and a larger number of households per cluster would have meant having to combine many villages together.

All calculations of the population were based on the latest Census population 1999. A listing in Excel of all villages by province together with numbers of households, numbers of people and census enumeration area number was obtained from the Census office.

In this sampling frame, the urban areas of Port Vila and Luganville were excluded on the basis that the prevalence in these areas is very low. No positive ICT tests have been detected by ongoing surveillance of residents of these areas presenting for malaria blood slides at the hospitals in these two centres.

The number of segments (groups of 15 households) in each village was calculated by dividing the number of households in each village by 15, and the result rounded up or down to the nearest whole number. The number of segments per village was put into a new column in the file. If a village had less than 8 households, it was combined with the next village for allocation of number of segments, as long as the two villages were in the same enumeration area. If not, it was combined with the previous village. This was to avoid combining villages in separate enumeration areas which are located far from each other.

A column containing the cumulative total segments was then added to the file. The total number of segments in each stratum was determined, and divided by 30 to give a sampling interval. A starting random number (less than the sampling interval) was determined from a banknote to pick the first selected segment (and the village it was in). Subsequent segments were selected by progressively adding the sampling interval to the previously selected segment number, until the end of the file was reached.

If a selected segment is located in a village with more than one segment, the village must be divided and a segment chosen randomly. This can be done by preparing a sketch map, dividing the village into approximately equal segments using landmarks such as paths and rivers, numbering the segments, and picking one randomly (e.g. out of a hat). Then all the inhabitants of all households in the selected segment must be tested.

C survey started in August 2005 with 2 villages at Torba province by national team. However due to the implementation of Global fund activities in Vanuatu we experienced shortage of manpower and time constraint to carry out both program within the same period. Therefore there were a small changes of workplan to decentralize the work to the provincial level by conducting a short field training at Maewo, Penama province with the Malaria Supervisors from Torba, Sanma, Malampa together with national team for them to learn on how to carry out the C survey at their province with the assistance from national team.

Along with the blood collection Knowledge, Attitude and Practice (KAP) study questionnaire were asked randomly within the communities to find out their knowledge of the program and the disease and to confirm the coverage of MDA and drug taking. The survey were conducted in a random sample of 600 individuals over the age of sixteen in Penama and in a minimum

of 100 people in each of the 5 other provinces using a questionnaire administered by interviewers.

2.3 Results

2.3.1 Prevalence of Infection

A total of 7584 sample size was tested for this survey and 13 ~~found~~ ICT positives ~~and~~ zero mf, makes antigenaemia prevalence of 0.17% (See Table 1). Penama province was group as strata 1 due to highest prevalence of antigenaemia during the baseline survey in 1998 and still came as the highest prevalence (0.12%; 9 ICT positives from 2592 samples tested) during this survey, followed by Torba (0.05%; 4 positives from 250 samples tested) which was grouped under the strata 2 together with Sanma and Malampa provinces. However for Sanma and Malampa provinces there were ~~none~~ ICT positives found out of 2540 samples tested.

Table 1: Vanuatu Filariasis C Survey Results by strata

STRATA

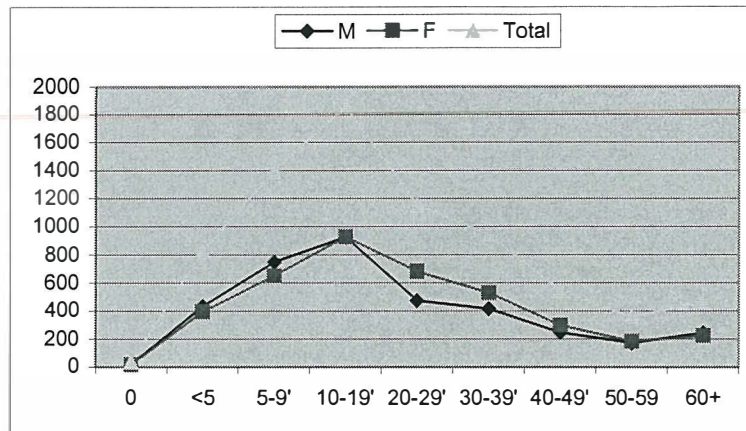
Province	Tested			ICT Positives			ICT Prevalence	Strata
	Total	Female	Male	Positive	Male	Female		
1 Penama	2592	1390	1193	9	4	5	0.12	1
2 Torba, Sanma & Malampa	2790	1388	1402	4	0	4	0.05	2
3 Shefa & Tafea	2198	1117	1072	0	0	0	0	3
Vanuatu	7584	3895	3667	13	4	9	0.17	
%		51.5	48.5	0.17	0.15	0.22		

Table 2: LF C Survey ICT Positives data by Sex and Age group

Sex	<5	5-9	10-19	20-29	30-39	40-49	50-59	60+	Total
M	0	0	1	0	1	1	1	0	4
F	0	0	0	3	2	2	1	1	9
Total	0	0	1	3	3	3	2	1	13
%	0	0	0.01	0.04	0.04	0.04	0.03	0.01	0.17

Within the positives cases there were more females positives compared to males and highest prevalence (0.04%) within the age group of 20 to 49 years old (See Table 2). Those ICT positives, 69% were from Penama province and 31% from Torba province. These synchronise with the Baseline survey and Mid Term where Penama province was the highest ICT prevalence followed by Torba province. Meanwhile Sanma, Malampa, Shefa and Tafea province had zero ICT and mf. There is ~~none~~ under five positives reported during this survey.

Figure 1: LF C Survey by Sex and Age group



Male: female ratios during this survey were similar to the Baseline and Mid Term surveyed and same goes to the proportion of people tested within the age of 10-19 were the largest proportion of age group tested (See Figure 1).

Table 3: Summary of LF Survey in Vanuatu

Particulars	Baseline 1998	Mid Term 2002	C Survey 2006
Sample size	5119	1167	7584
No. of Villages	51	8	133
No. of ICT Tested	4362	1167	7584
No. of ICT positives	209 (4.79)	92 (7.88)	13 (0.17)
M	116 (5.79)	56 (4.79)	4 (0.05)
F	93 (3.94)	36 (3.08)	9 (0.12)
No. of mf	106 (2.48)	9 (0.77)	0
M	66 (3.40)	6	0
F	40 (1.72)	3	0

The sample size for this surveyed were the largest compared to the previous surveyed that ever carried out for this program with 133 villages (See Table 3). Though each survey was carried out independently it shows clearly the positives cases decreases as the years goes on (see table 3). As for mid term in 2002 the overall prevalence was seen higher then baseline due to the smaller sample size and after we select the villages of the baseline and compared with the mid term

(sentinel sites) and standardized, it showed decreased of 63% for antigenaemia and 93.2% for microfilaria.

Beside the blood survey, team did short questionnaire with the community during the survey to find out current status of knowledge of the community towards the programme and mosquito net use. Outcome of the questionnaire shows 84.4% of the surveyed people reported that they did drink their medicine during the MDA programme and 15.6% did not take their tablets (Figure 2). Percentage of people who completed their 5 round of filariasis MDA was 38.6% and 6.9% who drink their tablet only one time during the 5 round of MDAs.

Wok survey

There were 48% of the sample size reported that they used their mosquito net and another 46% reported that they did not have their mosquito net during that time. This shows that almost 50 percent of the community did not have their mosquito net during that time and indicating that with current Global Fund programme which emphasize on the long lasting net distribution through out the country is really answering the need of the people of Vanuatu and in directly assisting filariasis programme in strengthening vector control activities.

Figure 2 : Percentage of people drink medicine during the MDAs.

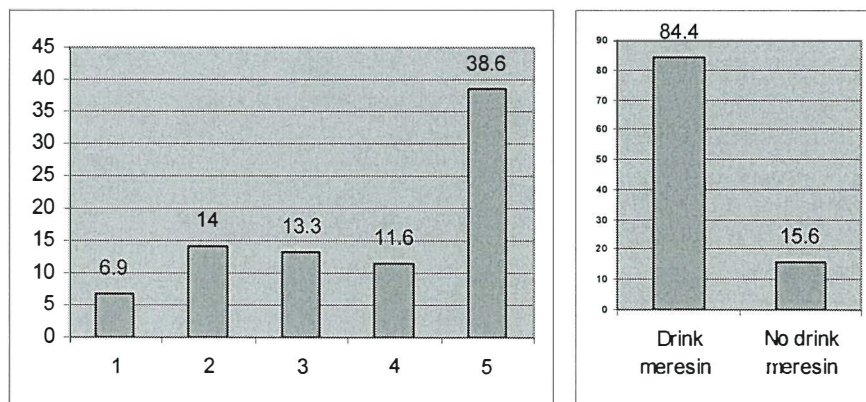


Fig 2

Result of the antigen and antibody test wasn't available due to the delay of James Cook University to carry out the test who is awaiting for the standard antibody method.

2.3.2 KAP survey

Altogether 1005 questionnaire were used and 95.5% reporting that they did received their filariasis tablets last year and drunk their tablets on the spot. When was asked why they took the medicine, 89.4% saying that they took it as they want to protect themselves from the disease and only 4.6% said that they took it ~~because~~ to stop the disease from spreading. In term of

ex

5a-1
awareness 96.1% saying that they heard of filariasis awareness in their area and 59.8% reported that they heard it through the health workers community talks, 23.3% through chief announcement, through friends and relatives 11.6% and church announcement 9.8%. Meanwhile other source of awareness like radio, news paper and posters scoring less than 3%, indicating how effective community awareness at rural area especially with the health workers.

93.2 % of the surveyed people willing to take part in the MDA if the program continue for another 5 years.

57% of the surveyed people reported that mosquito transmitting filariasis and 66% reported that people can protect from the infection of the diseases by taking the medicine and 13.3 % reported by using mosquito net.

Another 46% reported that if people had the disease they should go to hospital for assistance while 22% said they don't know what should they do.

2.4 Discussion

In term of MDA coverage, percentage of people who reported took their filariasis tablets were high (84.4%) and consistent with the KAP study where 95.5% reported that they drink filariasis tablet on the spot last year, these synchronize with the achievement of the national coverage above 80% for 5 consecutives years.

When people were asked how many time did they drink the tablet only 38.6% reported that they completed the five round. As the survey took place after nearly a year of the 5th MDA most people most likely tend to forget how many times exactly they drink their tablet. However with the antigenaemia prevalence of 0.17% and zero microfilaria Vanuatu C survey has shown us the impact of the 5 round MDA programme in the country. This is 96.5% dropped from our baseline and 97.8% dropped from the mid term.

Tie
Geographical pattern of the disease are still remain the same where Penama province still as the main province with filariasis prevalence of antigenaemia followed by Torba province. However, there were changes at Tafea and Malampa province where there were zero antigenaemia and microfilaria found and the same goes for Shefa and Tafea provinces.

Information that was passed within the filariasis awareness campaign did reach the community as above 60% of the surveyed people giving correct answer on transmission,

protection and what should they do if one of the family member had the disease.

In conclusion ICT test kits are still the best tools to use for filariasis survey as it can give the result on the spot and very sensitives in which community prefer however need proper explanation on the results so that normal people can understand easily. However the communication skills are needed for the team to communicate with the positives cases especially with those who continuously positives for more then 3 times though they were treated every time they were found positives. This continuously positives cases can caused confusion among the people and the health team if not really understand what is going on and it is hard for the ordinary people to understand and support the team for the future survey.

Due to lack of skill within the staffs in diagnosing lymphodema cases allowing difficulties during the field work when came across with these cases but can't give good explanation to the patients.

3.0 ^e Sentinel Site Survey

3.1 Background and Introduction

Vanuatu lymphatic filariasis program started with the baseline survey took place in 1998 which reveal a consistence transmission in the country. Penama province came as the highest prevalence of antigenaemia (14.95%) followed by Torba (10.17%), Malampa province (7.09%), Tafea province (2.53%), Sanma province (0.27%) and the lowest was Shefa province (0.15%).

MDA program started in year 2000 and after the 2 round of MDA a mid term evaluation took place in year 2002 showing 63% ^{dropped} of antigenaemia prevalence and 93.2% ^{dropped} of microfilaraemia from the baseline and MDA covarege rate ranged from 77.4% to 97.8%.

The villages that ^{were} surveyed during the baseline ^{were} was selected according to their high number of prevalence for the mid term and this villages was sustained as the sentinel sites and were continuously monitor their prevalence every year.

3.2 Methods

The same team that conducting the C survey did the sentinel site survey and every proceeding were the same as the C survey in which only ICT positives were further tested for mf and all ICT positives were treated after the mf slide collection at night with DEC and albendazole. Every people who came for ICT test

Baseline
mid term
survey

one

were also taken for further antigen and antibody test will be carried out by JCU.

3.3 Sentinel Site Results

A total of 618 ICT test carried out at 6 villages, only 1 positive found at Wanur village in Penama province makes antigenemia prevalence 0.16% (See Table 4) same as C survey antigenemia prevalence.

After comparison with previous surveyed ~~red~~ shows that the prevalence of antigenemia and microfilaria has dropped almost 100% after the completion of 5 round of MDA (see Figure 3& 4)

Figure 3: LF Antigenemia Prevalence

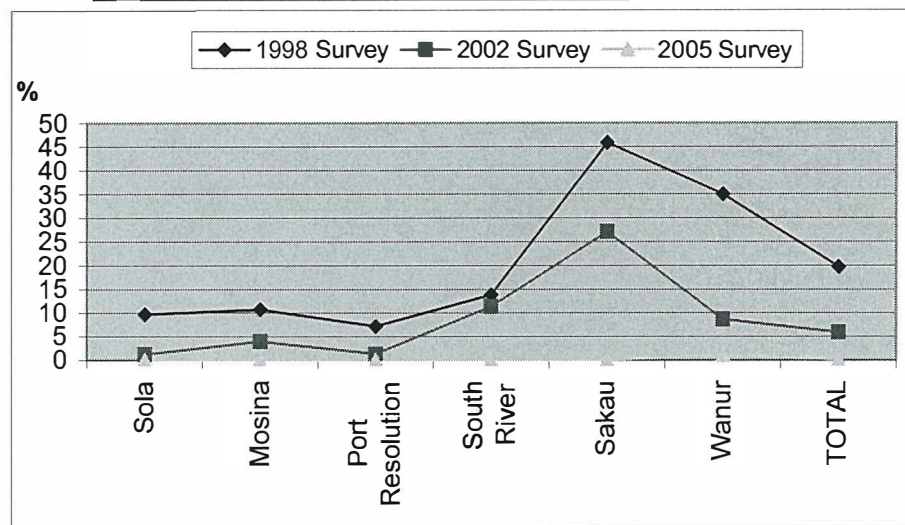
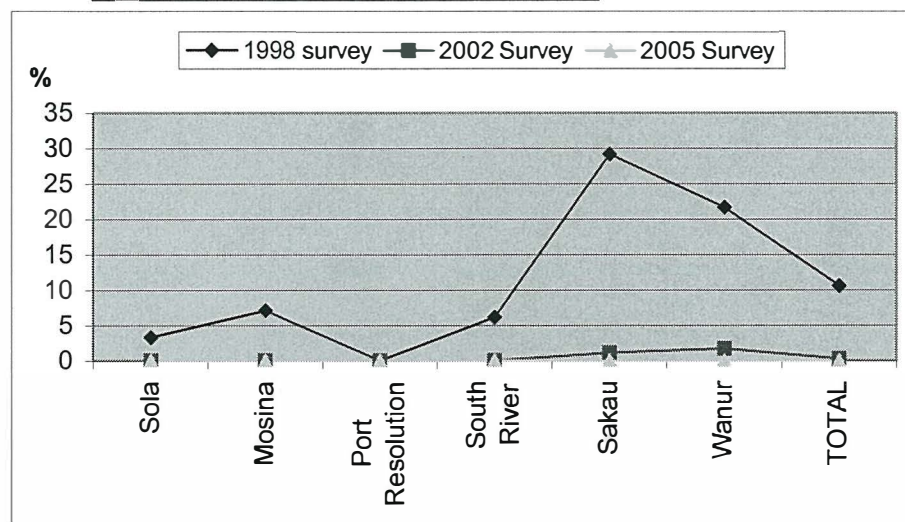


Figure 4: LF Microfilaria Prevalence



not
appear
graph
jointly

Antigenamea and microfilaria prevalence has dropped to 0% at 4 villages at Torba and Tafea province from the baseline 1999 and midterm 2002 surveyed.

Despite the sentinel villages there were few opportunistic test were carried out at 4 villages at Penama province (Beimateli, Baitora, Nasawa and Redcliff). During 1999 Screening Survey we found antigenamea prevalence were high at these 3 villages (Beimateli, Baitora and Nasawa) (see Table 5) and when we compare it with 2005 survey it shows 90.02% dropped of antigenamea prevalence and 100% for microfilaria prevalence. As for Redcliff at Ambae island the prevalence has dropped to 0% when compared with mid term survey (39.5% antigenamea prevalence and 11.62% microfilaria prevalence).

3.4 Discussion

Five round of MDA has given a very good impact on the filariasis prevalence in Vanuatu as both the C survey and sentinel site survey gave almost 99% antigenamea prevalence dropped and almost 100% dropped for microfilaremia prevalence through out the country.

However there were several villages with 3.21% antigenamia prevalence as shown in Table 5 at opportunistic test around Penama province. As we are not sure how long is the sensitivity of the ICT test after the treatment, sentinel site survey shall be continue to see the trend.

There were 3 cases of ICT positives at 5 years old (2 Female and 1 Male) from Baemateli village, Pentecost, Penama province. Positives cases among children are very important but quite confusing with the high reduction of antigenamea prevalence.

Two positives cases from Wanur villages were the same persons found positives in 2002 but negative in 1998 and both were 50 years and 75 years old. Therefore we are not sure are these new cases (within 1998 and 2002) or not.

How
positive?
added
to survey

Table 4: Sentinal Site Survey in Vanuatu

Province	Village	1998 (Baseline)		2002 (after 2 rounds of MDA)		2005 (after 5 rounds of MDA)	
		Antigenamia Prevalence (%) (No.positives/ No.tested)	Microfilaria Prevalence(%) (No.positives/ No. tested)	Antigenamia Prevalence (%)No.positives/ No.tested)	Microfilaria Prevalence(%) (No.positives/ No tested)	Antigenamia Prevalence (%)No.positives/ No.tested)	Microfilaria Prevalence (%)(No.positives/ No. tested)
TORBA	Sola	9.68 (3/31)	3.32 (1/31)	1.21 (2/165)	0 (0/165)	0 (0/154)	0 (0/154)
	Mosina	10.71 (3/28)	7.14 (2/28)	3.95 (3/76)	0 (0/76)	0 (0/80)	0 (0/80)
	Port						
TAFEA	Resolution	7.14 (7/98)	1.02 (1/98)	1.33 (4/300)	0 (0/300)	0 (0/135)	0 (0/135)
	South						
	River	13.85 (9/65)	6.15 (4/65)	11.36 (5/44)	0 (0/44)	0 (0/100)	0 (0/100)
PENAMA	Sakau	45.83 (22/48)	29.17 (14/48)	27.17 (25/92)	1.09 (1/92)	0 (0/61)	0 (0/61)
	Wanur	35 (21/60)	21.67 (13/60)	8.62 (5/58)	1.72 (1/58)	2.27 (2/88)	0 (0/88)
	TOTAL	19.7 (65/330)	10.6 (35/330)	5.9 (44/735)	0.27 (2/735)	0.32 (2/618)	0 (0/618)

Table 5: Filariasis Opportunistic Test

Province	Village	1999 (Screening Survey)		2002 (after 2 rounds of MDA)		2005 (after 5 rounds of MDA)	
		Antigenamia Prevalence (%)No.positives/ No.tested)	Microfilaria Prevalence(%) (No.positives/ No. tested)	Antigenamia Prevalence (%)No.positives/ No.tested)	Microfilaria Prevalence(%) (No.positives/ No. tested)	Antigenamia Prevalence (%)No.positives/ No.tested)	Microfilaria Prevalence (%)(No.positives/ No. tested)
Penama	*Beimateli	43.9 (68/155)	2.58 (4/155)	**	**	6.10 (13/213)	0 (0/213)
	*Baitora	77.8 (56/72)	26.39 (19/72)	**	**	4.76 (4/84)	0 (0/84)
	*Nasawa	20.7 (25/121)	4.13 (5/121)	**	**	0 (0/101)	0 (0/101)
	Total	42.82 (149/348)	8.05 (28/348)	**	**	4.27 (17/398)	0 (0/398)
Penama	*Redcliff	**	**	39.5 (51/129)	11.62 (15/129)	0 (0/132)	0 (0/132)
	Total	42.82 (149/348)	8.05 (28/348)	39.5 (51/129)	11.62 (15/129)	3.21 (17/530)	0 (0/530)

4.0 Summary of Recommendations

1. Continue surveillance at the sentinel site and hot spot area to see the pattern of reduction of filariasis prevalence
2. Continue to provide strong awareness and access to treatment at the health facilities at the hot spot area and area with low MDA coverage
3. Carry out D survey for 5 to 6 years old children to monitor any current transmission of filariasis within the community
4. Direct observed therapy in the distribution of the drugs should be highly encouraged in assurance of treatment coverage.
5. Strengthening mosquito net distribution as vector control for malaria and filariasis through out the country.
6. Increase mosquito net use awareness and surveillance at area with high cases of malaria.
7. Confirm the antigen ^{ei}amea prevalence of the C survey with the result of the antigen antibody test from JCU.
8. ICT test kit still remain as the best tool to be use for filariasis survey as it is very sensitive, provide result in a very short time, suitable in the field condition.
9. A program to deal with treating patients that have clinical symptoms of filariasis should be developed at national level.

5.0 Vanuatu Filariasis program Plan of Action for 2007- 2008

Activities	Staffs	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Sentinel survey	*FT/LW										
D Survey	*FT/GT										
Net Dist.	*GT										

*FT= Fasihah Taleo
 LW= Lenny Warele
 GT= George Taleo

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7.0 Appendices

1. List of filariasis positive cases for Sentinel site survey 1998-2005
2. List of filariasis positive cases for C Survey 2005-2006
3. KAP survey questionnaire