CHAPTER 6

CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

Malaria is one of public health disease of great importance in Vietnam. This disease is a burden for society in medical cost, and in days of labor cost, particularly in developing country like Vietnam. Every year, Ministry of Health spent about 70 billions VND for malaria control activities.But the Government budget only meets 60% of the total requirements of the National Malaria Control Program. So there is a need for seeking an appropriate measure in preventing malaria disease in terms of effective and cost. Many studies in different malaria endemic regions in the world have showed that Permethrin treated bednet measure has a good result in preventing malaria disease.

The results from this study showed that the Permethrin treated bednet measure was more cost - effective to both provider and patient side in study areas such as Tan Tap, Long Huu Dong communes (Long An) and Thong Nhat, Nghia Trung communes (Song Be).Beside calculating the cost - effectiveness, in this study, we mention cost - benefit also. After calculating the cost of treating bednets (cost) and avoided cost (benefit), the results showed that the benefit in these two places are higher than the cost.

But the effective rate of this measure depend on many factors :

Anopheles is susceptible to Permethrin, (see Appendix 7 for definition of susceptibility)

High coverage rate of bednets

Good community participation, the sleeping habit under bednets of people

Characteristics of vectors involved: endophagy, exophagy; endophily, exophily. The density of the main vectors, particularly the high density of mosquitoes when people go to bed, the rate of malaria disease and the parasite structure

One more important thing that can affect the result of Permethrin treated bednet measure is people's occupation, some occupation require people working outdoor at active time of the mosquito, particularly in the area where exophagic mosquitoes live. For these people, Permethrin treated bednet shows less effective and another protection measure should be considered.

The effective rate of Permethrin treated bednets depends on many factors according to different circumstances, so the cost - effectiveness and cost - benefit

change also. The higher initial incidence, the greater will be the potential reduction in incidence on application of a control measure.

When looking at the B/C in Long An (Tan Tap, Long Huu Dong) and Song Be (Thong Nhat, Nghia Trung communes), we conclude that this measure is more suitable in Song Be because we can save more money in these places. But in other places of Song Be such as Tho Son, DakNhau and Phu Rieng rubber company, the Permethrin treated bednet measure did not decrease significantly the rate of disease comparing untreated bednets, so it's not necessary to compare the cost - effectiveness and cost - benefits of two measures in these places.

Besides, Permethrin treated bednet measure decreases the number of patients in a gradual way; therefore, in the areas with high malaria rate and high risk of outbreak this measure is not suitable. In this case, we need other measures that can decrease the rate of disease quickly.

So, Permethrin treated bednet is a good measure in preventing malaria disease, but because the effectiveness of this measure depends on many factors; this measure, therefore, only shows more cost - effectiveness, cost - benefit as compared with untreated bednets measure in some areas, particularly in only some area *of* the forest region.

One more thing, we should pay attention to a rule with every measure for treatment and preventing disease. A new chemical measure often has good effectiveness in some first years of its usage with the spectacular results that become lessened along the time. This may be explained by natural selection phenomenon of creatures. The Permethrin treated bednet measure was researched in 1994 (from 1994 until now, we have not had the data about the effectiveness of Permethrin treated bednet measure comparing untreated bednets measure). So, in case of limited budget, we should consider to use this measure in appropriate areas.

6.2 Limitation of Study

This study did not measure the *level* of each factors that can affect the effectiveness, cost - effectiveness, cost - benefit because we know that the cost - effectiveness and cost - benefit of Permethrin treated bednet can be influenced by many interelated factors such as the rate of disease, the characteristics of vector, environment, income, education, habit of sleeping in bednet; So, further studies should be done in different circumstances.

This study was done based on secondary data that did not mention the number of severe cases and death. If we include the severe and death, the Permethrin treated bednet measure is more cost - effectiveness (but in fact, this study still ensures to have the exact results, because the number of severe cases and death of two districts in two provinces in the year under study were very low).

There was no analysis of malaria episodes in this secondary data, therefore, we have to based on a study by Pirom Kamol Ratanakul to make assumption to calculate the benefit and cost when including malaria episodes instead of incidence cases

6.3 Merit of Study

The study helps provide necessary information for National Malaria Control Program (NMCP) when making decisions involved. The NMCP can consider selection of Permethrin treated bednet measure and suitable areas for this measure in the context of Government's limited budget for preventing malaria disease.

6.4 Recommendations

6.4.1 Recommendation for Using Treated Bednets

Permethrin treated bednet is an effective measure in preventing malaria disease in some areas, but only using Permethrin treated bednet is not enough for preventing disease, we should pay attention to treat patient, it means to eliminate parasite in patients, and apply other measures at the same time (see Figure 1.1)

In areas where the rate of disease and outbreak risk are too high, other measures which can cut down quickly the transmission of disease like ICON spray should be considered. (Permethrin treated bednet measures reduces disease gradually)

Permethrin treated bednet measure is accepted by community and the technique is very simple. In addition, Permethrin can kill some other nuisance insects and this makes its usage wider. In order to limit the development of the resistance of mosquito to Permethrin, National Malaria Control Program should have the policy to control its use and should release regulations in terms of control and guidance of bednet impregnation with Permethrin..

Permethrin treated bednet measure should only be used in areas that have some conditions :

There are enough bednets for local people

Good participation of community such as the high rate of sleeping under bednets, and know how to preserve the treated bednets

People do not work outside at active time of mosquito (particularly in forest areas)

6.4.2 Recommendation for Further Studies

More cost - effectiveness, cost - benefit analyses should be studied in other areas. Some observations showed that the life expectancy of treated bednets may be

shortened. This needs to be considered in further studies in terms of cost – effectiveness and cost - benefit.