

## Chapter 5

### Conclusions of the study

#### 5.1 The conclusions of the study

This study has presented a model using data from four regions and the whole province of Yunnan to show the relationship between malaria incidence rate and malaria control activities, environmental and economic factors. The regression analysis showed that the model can be accepted, the statistical results suggest that the variables of preventive medicine and mosquito control activities are negative in relation to malaria transmission. Other variables such as, temperature and rainfall are also related to malaria transmission. The proportion of farmer population and mobile population are not sensitive in the regional model because of the grouping process. But they also affect the transmission of malaria, rural population suffer more risk than urban people. Mobile population with positive effect on malaria incidence rate, it worsens the malaria control. The proxy of variable GCP per capita may not be good in this model, or it has no effect on malaria incidence rate. The model cannot reflect the effect of surveillance and anti-relapse therapy activities using hypothetical data.

Based on the coefficients of determinants of preventive medicine and mosquito control activities in the models and malaria incidence rate, we calculated the marginal effect in four areas. After the analysis of allocative efficiency and equity, we get directions where and into which activity to input more resources. The result of allocative efficiency analysis showed that there are differences of ME between preventive medicine and mosquito control in south east and south west regions, and in whole province. ME of mosquito control is higher in these two regions and in whole province, more resources input to this activity can yield higher utility of malaria control activities and prevent more malaria and reduce the malaria incidence rate to lower level. The results of allocative equity analysis show that there are different ME between the north east region and the south east, south west regions. The ME of the north east region is lower than those of

two regions. In the south east and south west regions more resource is needed.

There are two ways to improve the allocative equity. First, to reallocate the resources between activities to improve the allocative efficiency, thus increasing also allocative equity; Second, to input more resources to the areas where allocative equity is poor.

## 5.2 Recommendation of the study

Malaria is a communicable disease, it is very difficult to control. Integrated malaria control activities have been conducted in Yunnan province to reduce the transmission. Which control activities will be emphasized and how much control activities should be conducted in different areas mainly based on their epidemiological features. But it can not answer if the combined malaria control activities is optimal in different areas.

The result of the study showed that the quantity of malaria control activities conducted will effect the allocative efficiency and equity. The local government should consider not only the epidemiological features but also their allocative efficiency and equity.

In south east and south west regions, government should improve mosquito control activities based on different situation, if there are more resources, they should be invested in mosquito control activities in these two regions, if there are no more resources can be input to these two regions, government can move part of resources from preventive medicine to mosquito control to improve the allocative efficiency.

From allocative equity point of view, the resources allocations between north east and south east, south west regions are unequity. North east regions shared more social welfare weight during 1993-1995. South east and south west region with higher malaria incidence rate compared with other regions and other provinces, they become the forward position of anti-malaria in the province even in China, while they shared less social welfare weight. More resources input to

these regions can reduce malaria spreading to other areas of the province and other provinces and increase the allocative equity in the province. Provincial government should input more resources to these two regions.

### 5.3 The limitations of the study

The time of the study was too short to obtain real data for all inputs, so some of data used in the study is hypothetical, based on experience. It may not reflect actual situation.

The GCP per capita may not be a good proxy of economic income, it is better to use average income of people, but I did not have this data in hand.

Incidence rate used in the study only reflect part of the malaria magnitude, it needs to be adjusted, because of lack of background data, I was unable to do this.

It is better to build models year by year, because ME depends on coefficient and incidence rate. In this way, we can feedback the information quickly, so that it is useful for decision makers.