CHAPTER 2

REVIEW OF RELATED LITERATURE

2.1 Malaria Control Programme in Vietnam

Malaria is widely known as an important public health problem in tropical countries. It causes one death every 20 seconds worldwide (*Kondrachine and Trigg, 1995*). What is malaria? Malaria is an infectious disease caused by protozoan parasites of the genus Plasmodium and transmitted by female mosquito of the genus Anopheles in which a part of parasite's development takes place (*Kaewsonthi, 1984*).

A lot of work has been done to prevent malaria but malaria still continues to be a major global health problem. The World Health Organization (*WHO*) estimated that 2,073 million people (over 40% of the world' population), living in more than 100 countries, are exposed to the risk of malaria and that some 270 million of these are infected with malaria parasites. While the number of cases reported to WHO were 5 million annually for the past years, the best estimate is that perhaps 110 million clinical cases occur every year, of which 90 million are in tropical Africa. Global deaths are estimated at approximately 1 million a year (*WHO, 1990*).

Previously, the eradication strategy was expanded all over the world but it is the complexity of malaria that has enabled it to resist so successfully the many and varied attempts to eradicate or control it. With this in mind and recognizing that the world wide eradication of malaria disease is not an attainable goal in the foreseeable future, the WHO Expert Committee on malaria in 1985 promoted an epidemiologic approach to the design of control which should be determined by the local epidemiologic situation, rather than by general control axioms (*WHO, 1986*).

Therefore, many countries in the world are trying nowadays to do their best to prevent malaria in many ways, most countries where malaria is an important public health problem have malaria control programmes. The

general objective of control programmes is to control the disease, to reduce mortality and morbidity rates. A lot of studies have been done in order to meet the objective.

In Vietnam, malaria situation has been a main concern of the government because Vietnam is in a highly malarial endemic area. The malaria eradication programme started in 1958 in the north and was extended to the south in 1975. As in many developing countries all over the world, a lot of difficulties obstruct the success of the programme.

Until 1991, in Vietnam, the malaria eradication programme was converted to a malaria control programme. Some technical problems arose such as malaria parasite resistance against antimalarial drugs, the main malarial vectors avoided or built up resistance against insecticide, migration of population and lack of fund for malaria eradication programme. The programme required the from the central authority for its success. Therefore since 1992, the National Malaria Control Programme was set up.

There are many studies about malaria undertaken in Vietnam by malaria experts in the country. A principle of malaria diagnosis and treatment from grass-root level for primary care to central level for tertiary care was introduced. It is very useful for malaria physicians to follow when they need a reference to provide malaria care (*Pham Song, 1994*).

After the period (1986-1989) of trial, in 1990, the application of permethrin impregnated bednets was extended to a large scale for protection of over 100,000 population living in malaria hyperendemic areas. The results of this application would be the basic model for national scale application *(Ngyen Phuoc Hong and colleagues, 1992)*.

It was found that this measure in combination with early detection and treatment has been effective in malaria control as follows:

- Number of malaria cases was reduced by two folds from 1986 to 1989.

- Number of severe cases and deaths was reduced by three or four times.

- Number of absentees from the work due to malaria was reduced by two fold.

The application of permethrin impregnated bednets was easily accepted compared to the acceptability of DDT spray. Besides the effectiveness of permethrin impregnated bednets on mosquitoes, they were also effective on head-lice, bed-bugs and cockcroaches. Moreover, it was also convenient.

The authors recommended that this measure should be applied on a nationwide scale for malaria control and therefore, requested support from the state.

In *Establishment of District Scale Malaria Control Model in Vietnam, (1992)* Vu Thi Phan stated that the model of district scale malaria control is necessary to be established in order to find out suitable measures for control of malaria resurgence.

Two districts in the North Mountain region, one district in the North Central Coast region, and an other district in the Mekong Delta region of Vietnam were selected for study. The study was conducted as evaluation of present status of malaria, networking of grass-roots health service, training, and health education. Conventional and supplementary control measures such as establishment of point of microscopes, treatment of drug resistant malaria, permethrin impregnated bednets etc. were applied. After five years of study in four districts with various socio-economic and epidemiological characteristics, the results showed that:

- Conventional measures were applied in Daitu district in the old malaria hyperendemic area in the North , improved the health service network, and thus reduced malaria, prevented the resurgence, and reduced the mortality and outbreaks of the disease.

- Tayson District in a malaria hyperendemic area in the center had technical problems. Various control measures were improperly applied,and hence malaria were not reduced. No outbreaks were recorded thanks to good epidemiological supervision.

- In Ngason District in a malaria endemic coastal plain area in the North, there was a microscope in each commune. Presumptive treatment with chloroquine in association with primaquine reduced malaria, and prevented outbreaks.

- In Cangiuoc district in malaria mezo-hyper-endemic southern coastal plain area, due to improper indication of various control measures and untimely regulation of health service network, malaria cases could not be reduced.

After five years of study, standardized malaria control could not be obtained, malaria transmission and the risk of malaria resurgence still exist.

Experiences drawn from the field indicate the need to combine activities to reduce malaria and prevent the outbreaks. These are the reorganization of grass-roots health services, full use of microscopes, proper indication of control measures, direction for good application of measures. These experiences are useful for contribution to the malaria control strategy in the country at present.

The review literature mentions studies in some countries in which the malaria situation is comparable to that of Vietnam.

In studies from neighbouring countries such as the Philippines, Laos, Malaysia the authors summarized current situations of malaria control activities in the those three countries (*CY Asinas, 1992; K.Pholsena, 1992; Lim 1992*). The climate, geography and culture of those countries are similar to Vietnam. Therefore, we can learn more from their experiences. For example, the objectives of their study are like the objectives of the programme in Vietnam, their exploration of entomology, parasitology and drug resistance can help us to prefer relevant options intervention measures to apply to vector control and promotion of individual protective measures against mosquito bites.

2.2 Health Manpower in Vietnam

The literature on the economic analysis and economic evaluation of malaria control is fairly extensive, but less is recorded about experience of the relationship between the distribution of qualified health manpower and the effectiveness of health programmes. Table 2.1 shows the existing situation of health manpower and health manpower for the malaria control programme in Vietnam 1994.

Table 2.1: The number of doctors per 10,000 population and number of doctors per 10,000 population for malaria control programme in Vietnam in 1994.

Regions	*No. of doctors per 10,000 population*	*No. of doctors per 10,000 population for Malaria control programme*
North Mountain	3.5	0.11
Red River Delta	3.6	0.08
North Central Coast	2.5	0.12
South Central Coast	2.31	0.13
Central Highland	4.9	0.19
East of Southland	3.9	0.08
Mekong Delta	2.2	0.08
The whole country	4.19	0.15

Source: Health statistics Yearbook, 1994, Hanoi, Vietnam.

According to World Health Organization in *"Strategie Mondial de la Sante' pour tous - Personnels de la Sante'" (OMS 1981),* the number of population per one health personnel is as in the following table:

Table 2.2: The number of population per one health personnel in undeveloped, developing and developed countries

Type of health personnel	*Under developed countries*	*Developing countries*	*Developed countries*
Health personnel (*)	2,400	500	130
Medical doctor	17,000	2,700	520
Nurse	6,500	1,500	220

(OMS, 1981)

Note (*): Health personnel here includes traditional health personnel.

The following table shows the number of population per one health personnel in Vietnam.

Table 2.3: The number of population per one health personnel in Vietnam

Type of health personnel	*Data in 1994*	*Policy of the government (1995-2000)*
Health personnel (*)	560 (18 Health personnel/ 10,000 pop.))	500 (20 Health personnel/ 10,000 pop.)
Medical doctor	2,390 (4.19 Drs/ 10.000 pop.)	2,500 (4 Drs/ 10,000 pop.)
Nurse	1,670 (6 nurses/ 10,000 pop.)	1,500 (6.7 nurses/ 10,000 pop.)

Note (*): Health personnel here includes traditional health personnel.

The table shows that in 1994, the number of doctors per 10,000 population marginally exceeds the policy of the government, while the number of othe health personnel or number of nurses is still lower than the criteria of the government. Why does this situation exist? This is a burning question for those who are working in training of health manpower field for the government.

In *Health manpower in primary health care in Vietnam, (1993),* Pham Huy Dung and colleagues found that in all seven demographic regions of Vietnam, the distribution of qualified health manpower is unevely distributed. In the urban area, a lot of new graduates cannot find jobs related to their specialization, while in the rural area, the shortage of health manpower is of serious concern. Some indicators showed the difference of

distribution of qualified health manpower between urban and rural areas such as:

Number of medical doctors in urban areas per 10,000 population: 8.12

Number of medical doctors in rural areas per 10,000 population: from 1.8 to 3.31

Number of medical doctors in the whole country per 10,000 population: 4.19

In conclusion, they said that the quality of health care services at the commune level and district level are still poor because of the insufficient quantity and quality of health manpower.

Some experience occurred in organizing and managing activities of health workers for the malaria control programme at a health station. According to this study, a mobile team for the malaria control programme should be organized at the health station, ready to carry out activities for the programme such as: indoor residual spray, care for malaria patients... But in fact, it is difficult to apply because of the shortage of health manpower and other resources *(Nguyen Ngo Huong, 1994)*.

Talking about human resource development, Stephanie Simmonds *(1989)* presented evidence that the morale of health personnel is fast becoming the major factor affecting both the sustainability and the quality of health care world-wide. Low morale mirrors problems ranging from declining balance of payments allocation to GNP, and a lack of support for the health system from the very top down to the rigid application of national pay, grading and career structures, and the stress of not being able to do the job properly.

While many of these and other problems have been avoided again and again in the press and in the academic literature, much of the work on health manpower development has focused on the planning and training of personnel. This has been with the aim of producing specific categories of better-trained health workers with relevant qualifications, resulting in a heavy emphasis on a quantitative output.

In this paper it is argued that the management of health personnel, the qualitative aspect of staff development, has been relatively neglected. Unless and

until the management of human resource development receives the attention it needs, seeds of discontent, disillusion and dissatisfaction will ultimately lead to the National health services losing their competitiveness as employers. The sustainability and quality of health programmes will then be in even greater jeopardy than they are at present.

The planning, production and management components of health manpower development have developed haphazardly as vertical activities. A new term such as "human resource development: the management of health personnel" might help ensure the concept of an integrated process contingent on economic, political, organizational and other important circumstances.

In a comprehensive review by Fulop (1986) the author questions whether manpower development is in a period of progress or stagnation. He concludes that the most important and urgent need that 'towers above the rest' is the motivation of health personnel through better manpower management. 'Only this can increase their effectiveness and productivity, improve their job satisfaction, and thus avoid the wastage of skilled personnel trained at high cost'.

Is it surprising that the management perspective of human resource development is in dire need of attention? Many health workers have a fairly clear understanding of what is meant by the words "the planning and production of personnel". But when asked to explain what "management" means, and more pointedly "personnel management", the sounds of groans, intermingled with confused thinking, can be heard reverberating off the walls of Ministries of Health, hospitals and health centers. The most obvious outcome has been an emphasis on producing specific categories of better-trained health workers with relevant qualifications to the relative neglect of considering both the overall context within which health personnel function, and the policy and practice of how best to care for careers once they have been trained.

Nakatani H (*1987*), one of the researchers from Japan found that the planning and distribution of medical manpower are extremely difficult in the context of a free- market system, such as those existing in Japan. The Japanese approach to the planning and redistribution of health manpower is multiple.

It appears from the Japanese experience that comprehensive measures, including planning of manpower, systematization of the provision of services, and career-development schemes, will work if they are coordinated. In this sense, coordination between health-service development and health manpower development should be further extended as recommended by the World Health Organization.

In another article (*Hatch, 1986*), the author reviewed the health manpower situation in the United States of America. He noted that there have been changes in how services are provided and financed and, concurrently, in how the professions are practiced and utilized. The author further mentionned that, in a developed and complex society possessing the largest volume and variety of information in the world, each societal factor produces myriad effects on supply and demand in the health sector. These factors include action by the Federal Government, the influence of health insurance (Medicare) population changes, restrictions on the immigration of professionals, the presence of minorities, and the growing presence of women in the labour force.

2.3 Health Manpower and Effectiveness of Health Care

The very interesting one and similar to this study is "*The Physician/ Population Ratio as a Proxy Measure of the Adequacy of Health care*" *(Chen and Lowenstein, 1985)*. The authors found that in the absence of service use and health status data at the individual level in most developing countries, the utility of the physician/ population ratio as a proxy measure of health service availability and use in health needs assessment is tested. Data from 60 predominantly developing countries show that the physician/ population is curvilinearly related to an indicator of population health status, such as infant mortality. When this relation is linearized by logarithmic transformation, the physician/ population ratio accounts for 53 % of the variance in infant mortality. There is no significant functional relationship between the physician/ population ratio and infant mortality when state-level data in the US are analyzed. Implications of these findings are discussed with respect to needs assessment in developing regions of the world.

In this particular study, the physician/ population ratio and the nurse/ population ratio were used as indicators of the availability and potential service of health care, and infant mortality as the indicator of population health status. A brief survey of the literature found no studies that dealt with either of the two as a measure in the assessment of demand for health care.

Infant mortality is chosen as a proxy of population health status because it is known to correlate with other population health status measures, such as general mortality, life expectancy, etc., and because it is known to be affected by the adequacy of health care in less industrialized societies.

The equation function used is:

$$Y = f(X1, X2)$$

Where:

Y = infant mortality.
X1 = Physician/ population ratio.
X2 = Nurse/ population ratio.

After trying several models, the equation to be used became finally: $ln(Y) = 4.21 - 0.46\ ln(X1)$

(In view of the fact that the coefficient of the nurse/ population ratio is not statistically significant, only the data of the physician/ population is used).

It was demonstrated with international and US data that the physician/ population ratio has a significant functional relationship with infant mortality when international data are used but practically no functional relation with infant mortality when data from an industrialized country, such as the US, is analyzed at the state level. The strong functional relationship was found internationally despite the known fact that both the physician/ population ratio and the infant mortality are notoriously inaccurate. A study by Stewart (1976) has shown that even in an industrialized country such as Canada, the official physician/ population ratio can be grossly inaccurate. As for infant mortality, the underreporting of infant deaths is well known. In El Salvador, which is officially regarded as having at least 90 % coverage of infant deaths, Palloni estimated that only 57% of infant deaths were registered in 1979.

In the discussion, Chen and Lowenstein stated that statistically, it has been demonstrated that the fallibility of either or both variables tends to attenuate any functional relationship between the two variables. Thus the strong functional relationship that they have found between the physician/ population ratio and infant mortality with international data would have been even stronger had they had more accurate data.

The question which Chen and Lowenstein put in our mind is then why this functional relation is absent in industrialized countries. The authors said that the explanation probably lies in the fact that in industrialized countries infant mortality or any other indicators of health status is more likely to be a function of other factors than the adequacy of health care. A good example is that of sickle cell anemia and other degenerative genetic conditions prevalent among specific population groups in the US. Until further biomedical research produces cures for these conditions, further reduction in deaths from these conditions will be impossible, no matter how adequate health care is.

They also showed an interesting example of the relation between the physician/ population ratio and infant mortality furnished by the USSR. According to a study by Davis (1980) the infant mortality rate in the USSR increased from 22.9 per 1000 live births in 1971 to 31.1 in 1976, in spite of the fact that during the same period the numbers of obstetricians and pediatricians increased substantially. Further analysis of the data showed that the increase in infant mortality occurred mostly in the Asian republics where the physician/ population ratio was comparatively quite low, but not in the European republics, where the physician/ population was high.

The higher infant mortality rates existing in many of the less industrialized countries are probably due to a combination of factors including infectious diseases and malnutrition, both of which are preventable with adequate health and social services. A dramatic example of the effectiveness of health care on infant mortality in an underdeveloped area comes from Australia, where introduction of modern health services in the aboriginal settlement of Cherbourg in Queensland in 1967 resulted in an annual rate of decline of 29% in infant mortality between 1967 and 1972.

In conciliation, Chen and Lowenstein said that in all parts of the world, where infant mortality rate is high, increasing health services will substantially help reduce number of infant deaths . In the absence of other health data, such as sanitation facilities or clinics, the physician/ population ratio is an adequate, albeit imperfect, indicator of health services availability or use in these regions.

Most of the above studies about malaria and health manpower are based on the experience of developed countries. It is not relevant to Vietnam, a developing country, including some studies about health manpower in Vietnam but not specific on the distribution of qualified health manpower in malaria control programme. Therefore, the study must be done to find out the best way which the allocation of health manpower can contribute to greater success.