



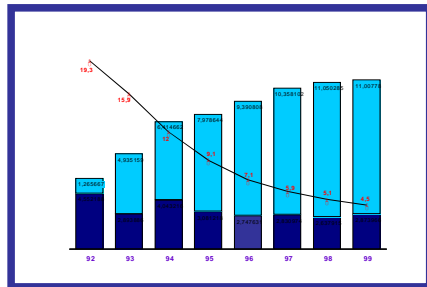
**WORLD HEALTH ORGANIZATION**  
REGIONAL OFFICE FOR THE WESTERN PACIFIC



## **The Control of Malaria in Viet Nam from 1980 to 2000: What went right?**

by

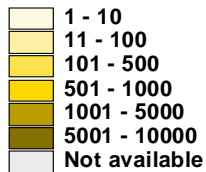
**Dr Mary B. Ettling**  
**WHO Consultant**



## **Vietnam**



No of confirmed cases, 2000



This report is the result of a consultancy carried out by Mary B. Ettlign, Ph.D., senior public health specialist, United States Agency for International Development (USAID) to Viet Nam in May – June 2002 on behalf of the WHO Regional Office for the Western Pacific. The analyses presented are based on data and information provided by Viet Nam's Ministry of Health and its institutions and on preparatory work by Dr Claudio Schuftan, Ha Noi, Viet Nam. The viewpoints are those of the writer and do not necessarily reflect those of the World Health Organization.

The Regional Office is grateful to USAID for releasing Dr Ettlign for this mission and to the many health professionals in Viet Nam, who so generously provided information and insights.

## CONTENTS

	<u>Page</u>
<b>Introduction</b>	<b>1</b>
<b>Background</b>	<b>2</b>
<b>Malaria in the 1980s</b>	<b>4</b>
<b>The example of Nghe An Province in the 1980s</b>	<b>6</b>
<b>The change in malaria in Viet Nam in 1990 and 1991: pivotal decisions</b>	<b>8</b>
<b>Why malaria went down in Viet Nam</b>	<b>14</b>
 <b><u>Tables</u></b>	
Table 1 - Malaria Indicators for Viet Nam, 1976-2000	3
Table 2 - Infant, child and under-five mortality rates, 1979-1993	6
Table 3:- EPI coverage 1986-96	6
Table 4 - Growth of Health Personnel in Viet Nam, 1976-1996	6
Table 5 - Malaria in Nghe An Province, 1981-2000	7
Table 6 - Ministry of Health Budget, 1991-1995	9
Table 7 - Malaria expenditures 1991-2000	10
Table 8 - Breakdown of central malaria budget	11
Table 9 - Five-year growth of GDP 1986-2000	14
Table 10 - Insecticides available in Nghe An, 1991-96	18
 <b><u>Figures</u></b>	
Figure 1 - Trends in Malaria Cases	4
Figure 2 - Trends in severe malaria	4
Figure 3 - Increased resources for health workers in Viet Nam 1991-2000	10
Figure 4 - Trends in malaria mortality and supplies of artemisinin drugs	15
Figure 5 - Malaria and antimalarial drugs in Nghe An	16
Figure 6 - Malaria morbidity and vector control	17
Figure 7 - ITNs and insecticides in Nghe An	18

# **THE CONTROL OF MALARIA IN VIET NAM FROM 1980 TO 2000: WHAT WENT RIGHT?**

## **Introduction**

The story on malaria control in Viet Nam over the last 20 years offers one of the stronger examples of the potential for Rolling Back Malaria. The success of Viet Nam in producing dramatic reductions in malaria morbidity and mortality over the last decade is often cited in strategic discussions for malaria control in situations all over the world.

Malaria in Viet Nam, as in several other parts of Southeast Asia was significantly reduced by the eradication programme of the 1950s and 60s. There was dramatic decline in malaria morbidity and mortality from this effort, and the reduced levels of malaria were sustained for the most part through the 1970s and early 1980s, a remarkable feat in the circumstances.

However, the situation began to deteriorate in the mid-1980s with increased numbers of cases and deaths. In 1991 the country suffered over 1 million malaria cases and over 4,000 deaths. Then in 1992 began a reversal of the process, and by 2000 only 29,300 cases and 148 deaths from malaria were reported—levels much lower than those of the 1970s. Of particular interest is the dramatic success Viet Nam has had in almost eliminating malaria deaths

There are important lessons that can be learned from the Viet Nam experience; they are best learned by examining both the period in which the burden of malaria rose and the period of sharp reductions in that burden. Problems in the economic, political, ecological and health system contexts contributed significantly to the rise in malaria in the late 1980s in Viet Nam. The economy was faltering; external support was disappearing, the extensive primary health care system was woefully under-resourced and beginning a period of major change in financing; Viet Nam was engaged in military action on two of its borders; population movement was extensive in areas of high malaria risk. In addition, the very nature of malaria was changing: parasite resistance to available antimalarial drugs was rising.

The reversal in the trend of malaria in the early 1990s is very much related to reversals in these negative social, political and economic factors. Significant changes in the malaria program itself, including specific strategic and technical elements, enhanced and expanded the benefits of a recovering economy and a renewed public health system.

Typically the success of malaria control in Viet Nam is ascribed to these latter factors—specific program and technical interventions. However, there are lessons to be learned as well from the "contextual" history. This paper will lay out some of the history, some of the factors in the success, and some of the lessons, generalized a bit to make them useful to other situations.

The factors to be discussed include:

- Amelioration in the early 1990s of socio-economic conditions that had exacerbated the malaria situation in the late 1980s

- Political commitment manifested in several ways as increased investment in malaria control by both central and local authorities, direct engagement in action, and “activation” of an already extensive primary health infrastructure
- Effective delivery of affordable and efficacious malaria treatment, including expanded access, local manufacture, and increased supply
- Mobilization of grass roots action for malaria, with ITNs as a centerpiece
- Strengthened peripheral capacity for surveillance and response to outbreaks
- Highly effective linkage of a strong technical program with a fully integrated PHC network
- Development and maintenance of a central capacity to identify problems, gather information, implement appropriate further research, and formulate practical and flexible evidence-based solutions and strategies
- General improvements in the standard of living and the economy of Viet Nam

### **Background**

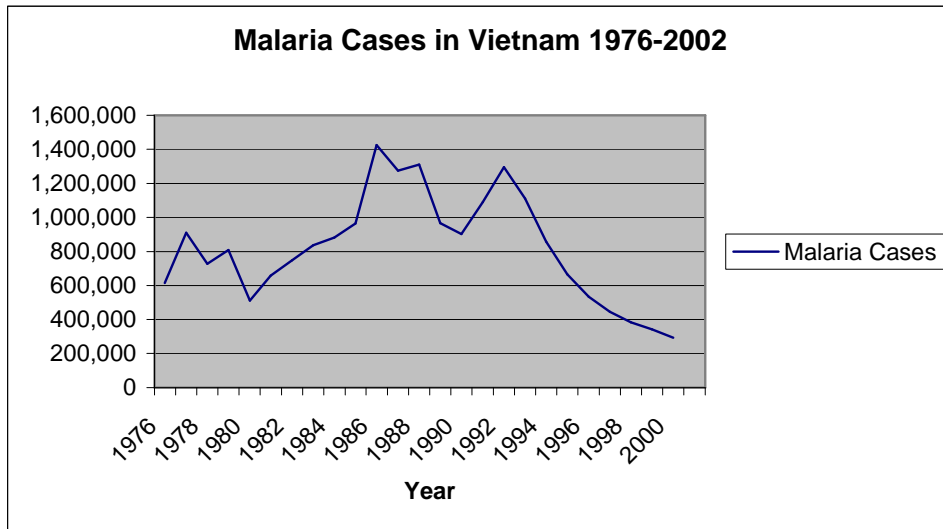
Trends in malaria control are often difficult to quantify; the usual parameters of cases, illness and deaths are frequently very sensitive to changes in the strength, coverage and activity of the health system, ecological and social changes, and behavioral factors. The overall number of cases in Viet Nam comprises both laboratory confirmed cases and those treated on the basis of a clinical diagnosis of malaria. Expanding coverage of malaria microscopy or peripheral health workers, both themselves indications of strengthened provision of services, will increase the number of cases detected, at least initially.

Throughout Southeast Asia, malaria is highly related to local environment, usually most endemic in hilly, forested areas but also with coastal foci of transmission and the phenomenon of man-made malaria in created environments such as plantations that mimic forest fringes. Movement of people into and out of malarious areas can have a large impact on the indicators of morbidity and mortality. Because of the marginal nature of malarious areas vulnerable populations, malaria is closely linked to poverty and living conditions.

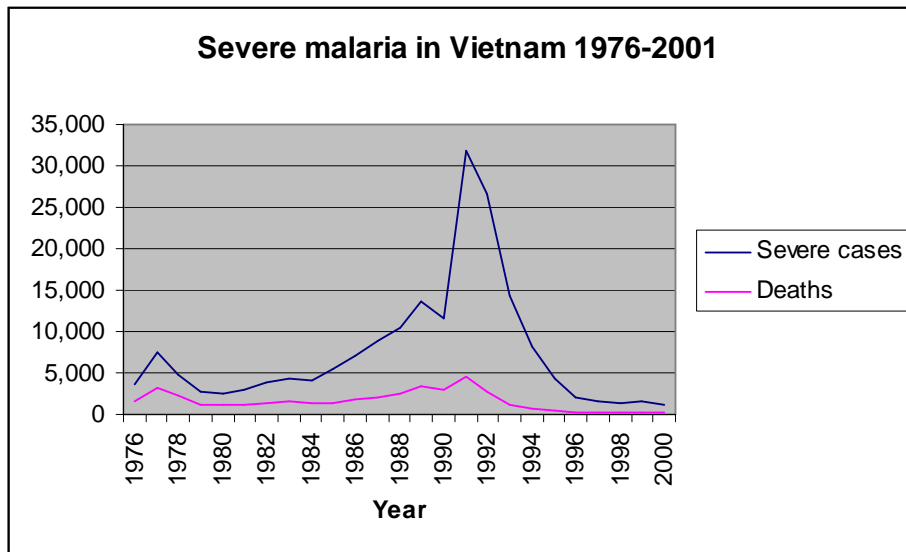
**Table 1: Malaria Indicators for Viet Nam 1976-2000**

	Clinical Malaria cases	Confirmed Malaria cases	Severe cases	Deaths
1976	615,147		3,595	1,513
1977	909,501		7,456	3,120
1978	727,984		4,800	2,291
1979	807,600		2,792	1,125
<b>1980</b>	<b>511,557</b>		<b>2,416</b>	<b>1,138</b>
1981	657,064		2,882	1,152
1982	747,228		3,950	1,368
1983	835,606		4,306	1,659
1984	880,713		4,199	1,256
1985	964,849		5,381	1,413
1986	1,424,919		7,056	1,838
1987	1,274,034		8,811	2,133
1988	1,310,387		10,470	2,465
1989	965,999		13,709	3,434
1990	902,789		11,613	2,911
1991	1,091,251	187,994	31,741	4,646
1992	1,294,426	225,928	26,553	2,658
1993	1,111,500	156,069	14,308	1,054
1994	858,000	140,120	8,073	604
1995	666,200	100,116	4,222	348
<b>1996</b>	<b>532,900</b>	<b>76,356</b>	<b>2,146</b>	<b>198</b>
1997	445,200	65,859	1,530	152
1998	383,300	72,091	1,447	183
1999	341,500	75,534	1,516	190
2000	293,000	74,316	1,161	148

**Figure 1: Trends in Malaria Cases**



**Figure 2: Trends in severe malaria**



### **Malaria in the 1980s**

Viet Nam, along with several countries in Southeast Asia experienced great reductions in malaria levels after the introduction of the global eradication campaign in the late 1950s. The strong specialized malaria expertise in Viet Nam was also established during this era at the National Institute for Malariology, Parasitology and Entomology (NIMPE) and in regional and provincial malaria offices. The reunification of the country and the malaria program in 1975 offers a useful point to begin a closer examination of the malaria situation leading up to 1990 and the pivotal period of change.

In the 70s and early 80s the indicators suggest a familiar picture of malaria in Southeast Asia: morbidity and mortality figures shifting around an average level (in this case 2-4,000 severe cases and 1-2, 000 deaths per year) with one-to-two year periods of increases indicating population movement, political events or epidemiological variation. But then in the middle 1980s the trend begins to build noticeably towards increased illness and deaths.

There were several things happening in and to Viet Nam during this period 1985-89:

- The Viet Nameese economy was doing poorly
- The government was maintaining military actions on its borders
- The historically significant support from the USSR to malaria activities in Viet Nam was faltering
- Resistance to antimalarial drugs was growing rapidly throughout the region
- New Economic Zones were being opened in highland areas at risk of malaria
- The health system in general was short of resources
- Focus on malaria had blurred after a long period of relatively low and stable morbidity and mortality

During the years 1989 and 1990 NIMPE was almost completely deprived of resources for effective field-level action in partnership with a health system faltering in the periphery due to lack of adequate salaries and commodities at commune and village levels. Yet, even during this period of rising malaria and greatly reduced resources in the general health system and for the malaria program, NIMPE was moving forward on several important technical fronts. It was during the period 1986-90 that Viet Nam was able to systematically pursue investigations into the efficacy of artemisinin drugs and the viability of efficient local production and deployment of them. It was during this period that NIMPE with its few remaining international partners was able to begin investigation of the effectiveness of insecticide-treated nets for control of malaria. It is striking that the central capacity within Viet Nam to address malaria, though severely hampered by lack of resources and a weakened PHC network, continued to identify problems, gather information relevant to those problems and formulate practical solutions. Viet Nam was never without strong, articulate, and responsive leadership of its malaria program.

During this period, NIMPE was suffering from both a specific resource drought for malaria, resulting perversely from the complacency arising in government from its successes in the previous three decades and the until-recently-unwavering support from the Soviet Union, and also from a general failure of resources in the health system. Particularly after the articulation of a policy of *doi moi* in 1986, in response to economic stagnation, and the resultant difficult transitions in the health system, resources for peripheral activity were greatly diminished. Changes in the systems for financing health and depleted government budgets meant that health workers throughout the system were inadequately compensated and without adequate supplies of essential drugs and commodities. Yet, the health system in Viet Nam, strongly committed to PHC, continued to exhibit progress in health indicators. Several indications of the progress made in PHC despite the acute problems of 1987 and beyond are shown in the following tables.

**Table 2: Infant, child and under-five mortality rates 1979-93**

	<b>IMR</b>	<b>CMR</b>	<b>&lt;5MR</b>
<b>1979-83</b>	<b>54.8</b>	<b>28.8</b>	<b>82.1</b>
<b>1984-88</b>	<b>46.0</b>	<b>24.9</b>	<b>68.7</b>
<b>1989-93</b>	<b>44.2</b>	<b>10.8</b>	<b>55.4</b>

**Table 3: EPI coverage 1986-96**

	<b>DPT</b>	<b>Measles</b>	<b>BCG</b>
<b>1986</b>	<b>42.6%</b>	<b>38.8%</b>	<b>54.5%</b>
<b>1990</b>	<b>86.7%</b>	<b>86.0%</b>	<b>89.9%</b>
<b>1996</b>	<b>94.4%</b>	<b>96.0%</b>	<b>95.4%</b>

**Table 4: Growth of Health Personnel in Viet Nam 1976-1996  
(per 100,000 population)**

	<b>Doctors</b>	<b>Medical assistants</b>	<b>Pharmacists</b>	<b>Nurses</b>	<b>Midwives</b>	<b>Total</b>
<b>1976</b>	<b>19</b>	<b>55</b>	<b>16</b>	<b>132</b>	<b>25</b>	<b>247</b>
<b>1986</b>	<b>32</b>	<b>70</b>	<b>18</b>	<b>136</b>	<b>25</b>	<b>281</b>
<b>1996</b>	<b>44</b>	<b>64</b>	<b>15</b>	<b>58</b>	<b>17</b>	<b>198</b>

### **The example of Nghe An Province in the 1980s**

At the end of the 1980s, Nghe An Province maintained a health network at provincial, district and commune levels of almost 6,000 health staff. Of a total of 466 communes, 51 were without a medical doctor, served by a medical assistant or nurse. There were a total of 277 village health workers in the total of 2958 villages in malarious areas.

The population of Nghe An is approximately 3 million, with half in malarious areas (800,000 in hyperendemic highland villages).

The Provincial Malaria Centre comprised 55 staff with a budget under 500 million VND per year (approximately US\$45,000). The budget per capita for malaria is estimated at less than 1,500 VND per capita in the 6 highly malarious districts at that time (100 VND or less per capita in less-malarious midland and delta districts of the province). Malaria activities comprised treatment and residual spraying. Microscopy was pretty much limited to hospitals and polyclinics; there were a total of 127 microscopy points in 1990, only 108 at commune level.

The only mosquito nets used were those made locally, and use of even these was relatively low at 30-40%. No nets were available in the market, and no insecticides were used to treat nets. A pilot study of ITNs was begun in 1991 in one district with support from the Netherlands.

Malaria deaths in Nghe An had been rising from 17 in 1986 to 239 in 1989 and a spectacular 824 deaths in 1991. The number of documented outbreaks in Nghe An shot up from 12 in 1990 to 68 in 1991.

**Table 5: Malaria in Nghe An Province 1981-2000**

	Clinical cases	Deaths	Slides taken	Outbreaks	Protected by insecticide
1981	12,944	19	65,968	14	440,046
1982	30,405	31	69,175	30	134,585
1983	83,938	514	82,156	58	225,147
1984	63,115	122	71,526	10	426,341
1985	60,676	33	108,447	6	480,812
1986	38,538	17	84,456	9	470,462
1987	118,573	163	80,202	15	226,528
1988	92,141	111	95,216	7	90,080
1989	98,969	239	68,002	7	99,367
1990	94,929	225	59,419	12	240,552
1991	108,989	824	62,650	68	190,088
1992	124,670	258	88,978	35	237,060
1993	84,858	32	69,472	3	361,510
1994	46,284	18	70,205	0	446,878
1995	29,901	4	100,101	0	631,463
1996	21,827	3	94,291	0	569,888
1997	15,464	2	77,633	0	603,493
1998	13,700	2	102,622	1	705,499
1999	10,252	1	75,251	0	738,480
2000	6,262	0	47,953	0	753,989

\*Note: apparently the province split in two in 1992. This could explain some of the reduction in malaria from 1991 to 1992, but the growth in population protected is therefore more difficult to understand.

The staff of the provincial malaria center vividly recalls the events of 1991, when the malaria deaths in the province represented 18% of all malaria deaths in Viet Nam. There was no insecticide available for vector control; the former supplies from the USSR had finished in 1989, and the malaria team had been able to do no indoor residual spraying at all in 1990. The supply of antimalarial drugs was inadequate both in kind and in quantity; the team had only 104,000 doses of antimalarials to treat 108,989 cases. The drugs available were either those whose efficacy against falciparum parasites was significantly diminished by that time (chloroquine and sulfadoxine/pyrimethamine) or what was described by the local staff as “antique” quinine. There were virtually no artemisinin drugs available in the province at that time. Fuel, vehicles, laboratory supplies, support for staff in the field: all were in short supply.

What happened in 1991 that led to the sharp increase in malaria morbidity and mortality?  
The former head of the provincial malaria center cites four factors:

- Difficulty in acquiring drugs and insecticides
- The impact floods and the resulting loss of food supplies on the lives of village people
- Movement of people into malarious areas as a result both of the economic stress of the floods but also to mine rubies
- Lack of salary support for peripheral health staff caused them to be supporting themselves and their families rather than on the job

The situation in Nghe An clearly mirrors the situation nationally: a resource-poor malaria program, a health system in a nadir of its transition under *doi moi*, and economic and social events highly conducive to resurgent malaria.

### **The change in malaria in Viet Nam in 1990 and 1991: pivotal decisions**

The rising malaria morbidity and mortality finally became intolerable. The number of malaria deaths and the sharply increased numbers of severe cases were brought to the attention of top political leadership both by NIMPE and by constituencies of the General Assembly that were most affected. Malaria threatened not only the health and well-being of the population (malaria was the leading cause of death in 1991) but also political stability in remote ethnic minorities, opening economic areas and borders. Political leadership responded. This was not a new commitment to health; that was and had been maintained as much as possible through three decades of building of grass roots PHC; this was a new commitment to the control of malaria as a priority health program.

Political leadership responded in three ways: greatly increased funding for malaria both centrally and at provincial levels; direct engagement in strategic guidance and implementation of necessary actions at all levels; and support for renewed leadership for malaria control within the recently outlined Global Strategy for Malaria Control.

Table 6 shows the absolute and relative levels of support for malaria in the period 1991-95. There were sharp increases in expenditures on health in 1992 (60% in one year). The increases in funding for malaria as a priority categorical program increased even more sharply (almost 6-fold). And this trend continued.

**Table 6: MoH budget 1991-95 (US\$ million)**

	<b>1991</b>	<b>1992</b>	<b>1993</b>	<b>1994</b>	<b>1995</b>
<b>National health budget (excluding FP)</b>	66.5	106.9	152	168	
<b>International support</b>	26.5	34.7	38.8	35.7	
<b>TOTAL HEALTH</b>	<b>93.0</b>	<b>141.6</b>	<b>190.8</b>	<b>203.7</b>	
<b>Categorical programs (total)</b>	2.55	5.23	9.7	19.8	31.2
<b>Malaria control</b>	0.55	3.2	4.1	5.2	6.4
<b>Nutrition and goiter</b>	2.0	5.2	2.5	2.9	5.7
<b>EPI</b>		1.5	1.0	2.2	3.6
<b>HIV/AIDS</b>		0.5	0.12	3.5	4.1
<b>TB and leprosy</b>					2.3
<b>Upgrading and PHC</b>			2.1	6.0	9.1
<b>% malaria of categorical</b>	21.6%	61.2%	42.3%	26.3%	20.5%
<b>% malaria of total</b>	0.6%	2.3%	2.1%	2.6%	

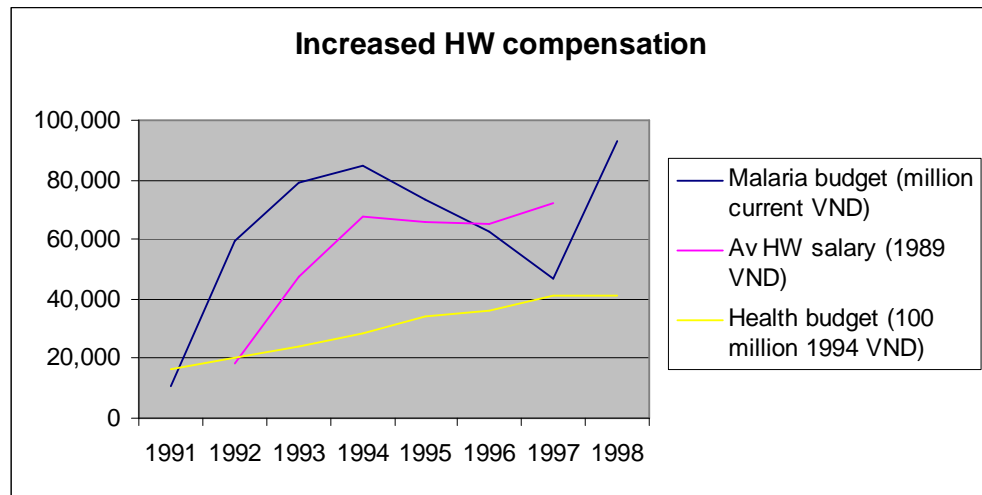
Increased malaria resources were provided from both central and provincial level, as the following table shows. In addition, decisions of and prioritization of malaria by the government led to greatly increased external funding for malaria. Both the number of international partners and the level of financial support from them for malaria control activities increased after 1991.

Figure 3 shows clearly that compensation for health workers grew faster than overall health budgets. The increased malaria (and health) resources didn't so much "grow" the health network at the periphery as "activate" the existing PHC network by providing both commodities and necessary incentives to keep staff at the job and effective. Thus, this adjustment of salaries was the beginning of a recovery of the health network in the period of transformation. But in malarious areas, as the example from Nghe An will show, malaria resources were targeted specifically at commune and village health workers participating in activities such as mobile teams, early treatment and surveillance, microscopy and prevention campaigns. NIMPE and the regional and provincial malaria centers were also "activated." The number of malaria staff did not rise much, but the potentiating resources made the existing teams more active and effective.

**Table 7: Malaria expenditures 1991-2000 (VND million)**

	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Central government	6,000	33,700	50,000	65,530	61,618	56,000	40,000	42,763	45,500	41,544
Provincial government	3,238	8,000	15,000	10,000	2,634	2,215	2,617	11,400	5,200	7,717
<b>Total government</b>	<b>9,238</b>	<b>41,700</b>	<b>65,000</b>	<b>75,530</b>	<b>64,252</b>	<b>58,215</b>	<b>42,617</b>	<b>44,163</b>	<b>47,700</b>	<b>49,261</b>
External support	1,219	17,930	14,385	9,181	8,948	4,401	4,232	39,190	45,630	7,163
<b>Total</b>	<b>10,457</b>	<b>59,630</b>	<b>79,385</b>	<b>84,711</b>	<b>73,200</b>	<b>62,616</b>	<b>46,849</b>	<b>83,353</b>	<b>93,330</b>	<b>56,424</b>
Per capita at risk	306	1,701	2,206	2,293	1,930	1,609	1,173	2,277	2,289	1,306

**Figure 3: Increased resources for health workers in Viet Nam 1991-2000**



Although, as Table 9 shows, the largest part of the central budget for malaria was for commodities, the increased resources, particularly those at provincial level, were quickly used also to provide innovative elements: financial incentives to commune and village health workers, the beginnings of an extensive process of "socialization" of malaria control through grass-roots and mass organizations such as women's and youth groups, and provision of IEC materials to improve behaviors related to malaria control. Malaria staff in Nghe An described the use of provincial budget allocations for IEC and staff incentives in particular. Antimalarial drugs and insecticides for treatment of nets both are provided free and remained the essential justification for and basis of the malaria control program in the early 1990s.

**Table 8: Break-down of central malaria budget (US\$ 000s)**

<b>Item</b>	<b>1994</b>	<b>1995</b>
<b>Antimalarial drugs</b>	1,727	1,382
<b>Vector control supplies</b>	1,850	2,792
<b>Laboratory supplies</b>	152	184
<b>Health education</b>	127	227
<b>Training</b>	270	317
<b>Mobile teams</b>	409	528
<b>Surveillance</b>	318	281
<b>Transport</b>	91	128
<b>Vehicles</b>	145	327
<b>Emergency stocks</b>		91
<b>Evaluation, management</b>		104
<b>TOTAL</b>	<b>5,089</b>	<b>6,364</b>

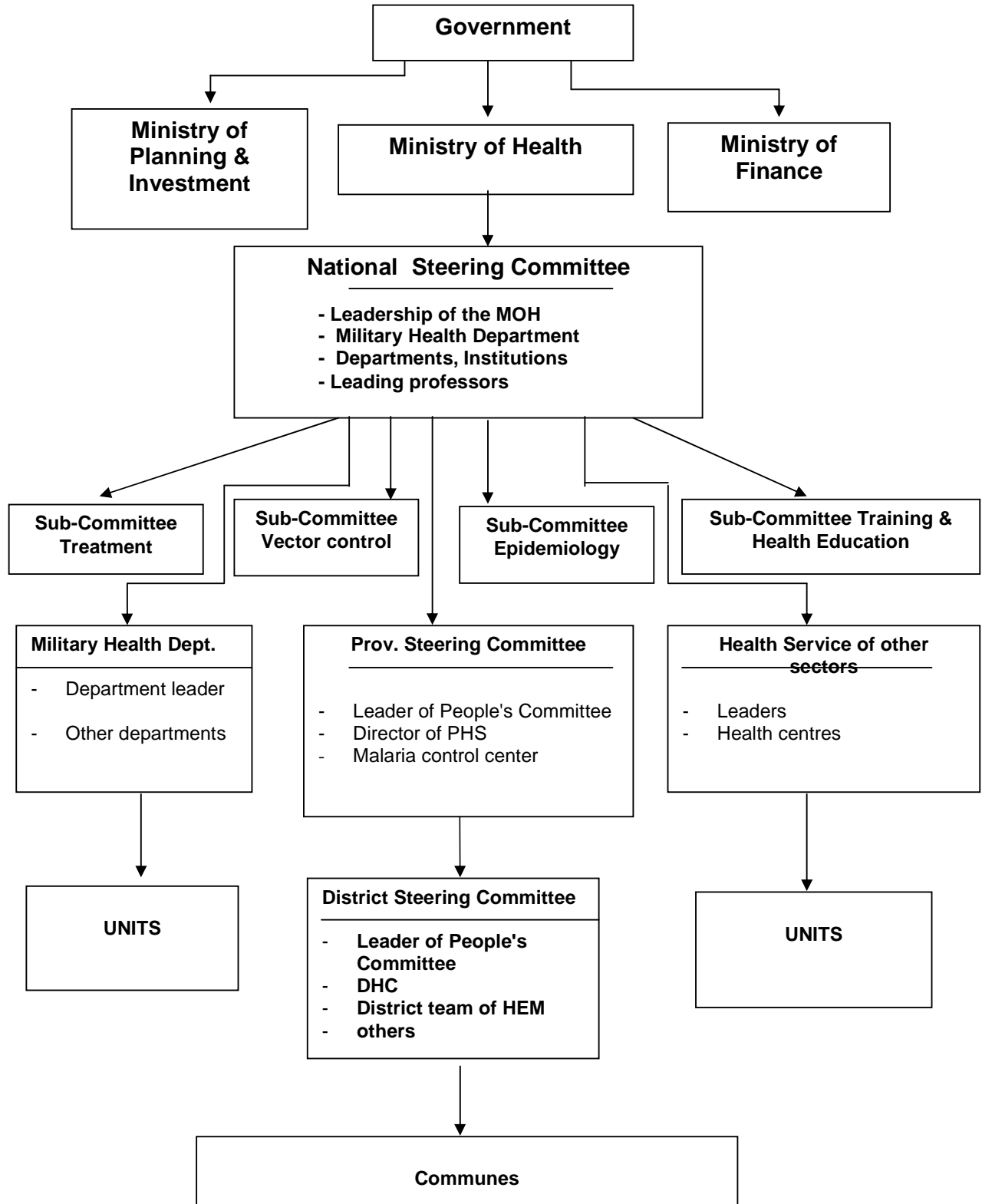
Engagement of political leadership in malaria action was organized at each level: national, provincial, district and commune. Two factors in the structures of linkage (outlined in the figure below) are most noticeable. First is the systematic linkage of health and political vertical structures (including the military) at each level. In descriptions of the success of this collaboration, several of those interviewed from both the health and the political sides mentioned the knowledge of malaria and its control that true engagement in the Steering Committees meant for local authorities. In the linked contractual relationship of responsibilities and resources each side has a role in the shared and agreed workplan and strategy. This explicit relationship of technical expertise and local authority enables effective joint action.

The other aspect of the linked structure is the level and nature of the linkage of the expert malaria program with the general health system. The malaria program does not implement actions at any level below the province, but rather provides support and resources (both financial and technical) to the general health services in a variety of forms. Specialized malaria staff work with the general health systems:

- In the steering committees that set objectives for malaria control, establish budget allocations, report results and revise strategies;
- In the conduct of campaigns such as those for regular re-treatment of nets in villages;
- In the maintenance of malaria surveillance; the GHS supports village health workers in reporting malaria cases and the epidemiological expertise of the provincial malaria center analyses and determines the necessary response;
- In the active response to outbreaks by mobile teams comprised of both malaria and general health staff;
- In supervision of specific technical functions such as malaria microscopy that are part of the GHS activity in district and commune health facilities;
- In technical training of GHS staff.

The strong malaria expertise in NIMPE, the sub-IMPEs, and the provincial malaria centers is able to assist and support actions of the health network, but also to maintain technical leadership, develop clear technical guidelines and strategies, and maintain support and interest in malaria among political leadership. One of the important lessons from Viet Nam's success in malaria is the balance that has been maintained between an integrated, decentralized health system and a strong, technically sound body of malaria expertise in the country. And the balance of the two is productive because of the nature of the three-way links between malaria, general health and political authority.

**MANAGEMENT SYSTEM OF THE NATIONAL MALARIA CONTROL PROGRAM**



## **Why malaria went down in Viet Nam**

### The economy was recovering

One senior former official who was interviewed described 1988-90 as a time of social and economic crisis. The changing economic policies had indirect but acute effects on the health and physical well-being of people. Resulting extremely low incomes and food shortages themselves made people more vulnerable to illness and death. In malarious areas it may have been difficult to ascribe a single cause of death. But economic vulnerability also necessitated reliance on work in the forested areas of highest malaria transmission. When you cannot make a living at home, you must try elsewhere.

Large numbers of people were returning from Cambodia, at that time itself suffering an uncontrolled resurgence of multi-drug resistant malaria.

But in the early 1990s this social and economic crisis began to improve. And it can be argued that the malaria situation in Viet Nam began to improve with it. Malaria is a disease related to poverty. In Southeast Asia, this association is both direct (poor people cannot protect themselves from or adequately treat themselves for malaria) and indirect (people who are poor and marginal either live in or move into the remote hilly forest edges available to them). A strong and active public health network can compensate for this link of malaria and poverty by providing access to prevention and treatment.

The economy of Viet Nam was growing in the period 1990-95 (Table 10). Gross domestic product (GDP) was growing at 8.1 to 8.8 % per year. In 1994 the GDP was US\$ 213 per capita. Total state revenue was also growing (from 15.2 % of GDP in 1990 to 23.6 % in 1993), and was US\$ 2927 million in 1993. Of this total, US\$ 739 million (25%) was spent on the social sector and 5 % on health, not including family planning, an equivalent of US \$2.03 per capita.

---

**Table 9. Five-year growth rate of GDP 1986-2000**

<b>1986-90</b>	<b>4.4%</b>
<b>1991-95</b>	<b>8.2%</b>
<b>1996-00</b>	<b>6.9%</b>

---

The economy grew, and some of the growth was used to fund health programs, in particular malaria control activities. This is surely one of the obvious lessons to be learned from Viet Nam's experience: economic growth increased income and relieved the malaria burden. But Viet Nam also seized the opportunity to sharply increase program funding for health and for malaria control.

### Treatment got more effective

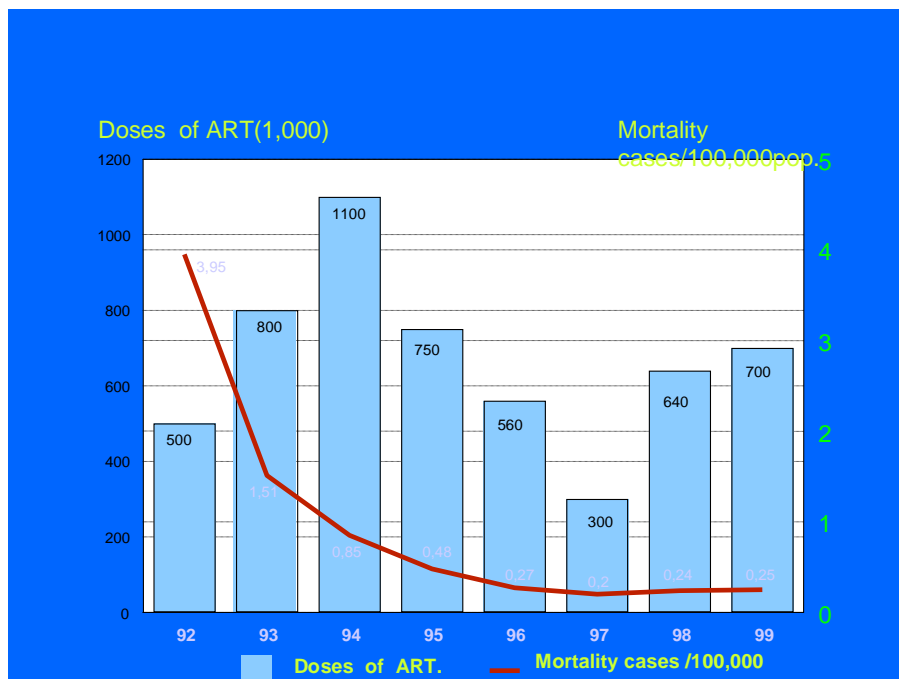
During the period 1988-91 when malaria was at a crisis in Viet Nam, several decisions were made regarding treatment. Reduction of malaria mortality was clearly identified as the prime objective of the malaria effort, and effective treatment was clearly identified as

the toll for reducing mortality. Effective treatment was to be obtained by expanding access to treatment. The expanded access would deliver efficacious drugs.

- Malaria treatment was to be available at village and commune levels in all areas of malaria risk; this entailed adequately supplied and supervised expansion of the health network
- Malaria treatment would be exempted from the new general policy of users' fees for health
- Artemisinin drugs (artemisinin and artesunate), because of their rapid action to reduce symptoms and parasitemia, were to be widely deployed to save lives
- Supplies of artemisinin drugs would be maximized and cost (particularly the need for foreign currency) minimized by the development of local production; Viet Nam would move towards self-sufficiency for the primary commodity of its malaria program

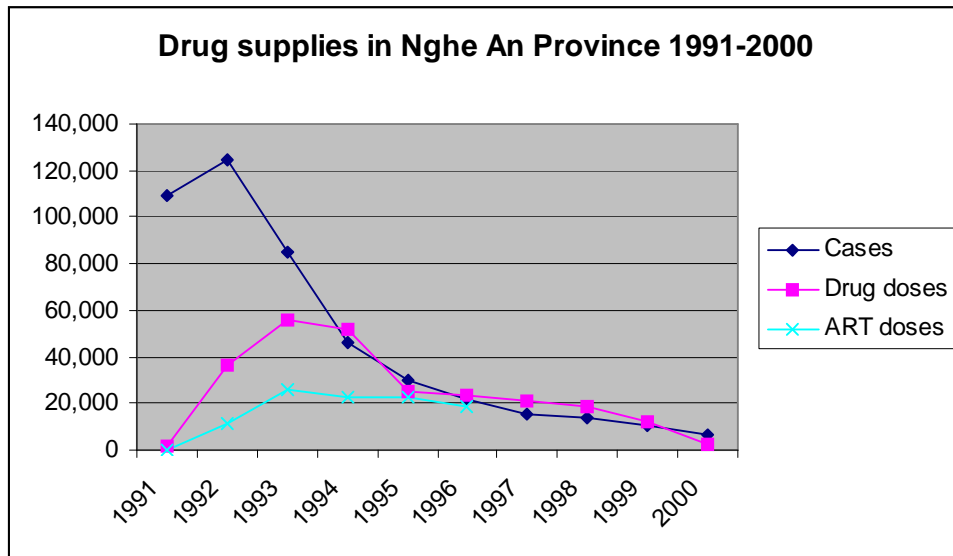
All of these decisions are important, not just the choice of drug. Data suggest that it was not until 1995-6 that adequate supplies of artemisinin drugs were widely available in all parts of the country. Yet malaria was already going down almost everywhere, particularly deaths. This suggests that there was benefit from the “activated” access to treatment, even when what it could deliver were less efficacious drugs such as SP or quinine.

**Figure 4: Trends in malaria mortality and supplies of artemisinin drugs**



The situation in Nghe An Province shows this clearly. There was an increase in the provision of antimalarial drugs to a total of 140,000 doses by 1992. But in this first post-epidemic year the drugs available were still not the best for treatment of resistant falciparum parasites: 93,300 doses of chloroquine, 25,000 doses of intramuscular sulfadoxine/pyrimethamine. But there were also 11,000 doses of oral artemisinin drugs, rising to 25,000 doses in 1993. The table below shows the relationship of cases and drugs in Nghe An for this period. It is really only in 1994 that drugs available catch up to cases, and 1995 before the supply of artemisinin drugs “covers” all cases.

**Figure 5: Malaria and antimalarial drugs in Nghe An**



The crucial lesson to be learned from Viet Nam's success about treatment is not only the deployment of efficacious drugs, but also how this improved treatment was deployed. Much of the reduction in death in Nghe An can be ascribed to activated peripheral care of any kind in the period after the 1991 crisis. The rapidly increased budget for drugs, supplies and health worker compensation as well as the mobilization of teams in the periphery, even when the drugs were still for the most part chloroquine, sulfadoxine/pyrimethamine and quinine, certainly played a role.

Viet Nam also made crucial decisions, backed up by political commitment, to ensure availability of efficacious and affordable treatment. In the early 1980s Viet Nam began investigating the potential of artemisinin drugs. After demonstration of the efficacy of the drugs, the possibility of local cultivation of *Artemisia annua* and the feasibility of local extraction, an inter-ministerial committee chaired by senior leadership was formed to pursue local production. The volumes of artemisinin drugs produced by Viet Nameese factories increased rapidly over 2-3 years, prices went down, and in the face of quality problems the government and the malaria control program were able to act quickly and decisively to make necessary corrections. The objectives were effective prevention of

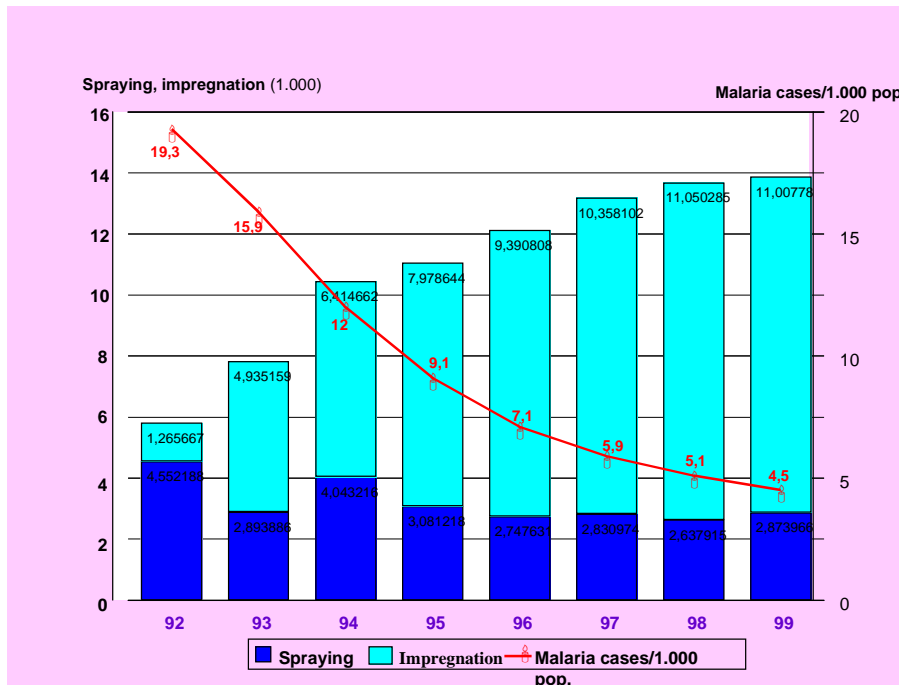
malaria death at an affordable cost and avoidance of reliance on foreign currency for drug procurement. Both objectives were met.

The NIMPE expertise linked to high-level political commitment to the aim of reducing malaria mortality rapidly and efficiently with the limited resources available around 1990 enabled a clear articulation of the rationale behind local production and the use of artemisinin drugs as monotherapy. This was not a direction endorsed by international experts. Yet, Viet Nam pursued its strategy based on the realities in the country and derived the benefit from that self-reliance.

### Insecticide-treated nets were deployed

This often-cited factor in Viet Nam's malaria success is another example of an observation that misses the more interesting point. It is not the fact that Viet Nam deployed nets that is important so much as how the deployment was carried out and, in an environment of greatly reduced malaria impact, the role that ITN services play in sustaining the all-important health service-community links.

**Figure 6: Malaria morbidity and vector control**



Although there is a clear temporal relationship between the ramping up of ITNs in Viet Nam and the reduction in both cases and deaths, the level of coverage may not have been broad enough yet in the early 1990s to have played a major role in the sharp decline in malaria. In fact there is little clear evidence of the epidemiological impact of ITNs in Viet Nam, or elsewhere in Southeast Asia, compared with the clear, large impact seen in Africa. This blurred impact on transmission may be related to particular human and vector behaviors which play an important part in malaria transmission in Southeast Asia. However, ITNs can and do play a vital role in malaria control.

Similarly, it is difficult to see a specific impact of increased use of ITNs in the earliest 1990s when the malaria situation improved rapidly in Nghe An Province. The cumulative number of nets provided to the populations in Nghe An remained relatively small until 1997 (Fig. 8). The supplies of insecticide for treating nets also remained relatively small until 1994, after the dramatic fall in cases and deaths (Table 11).

Figure 7.

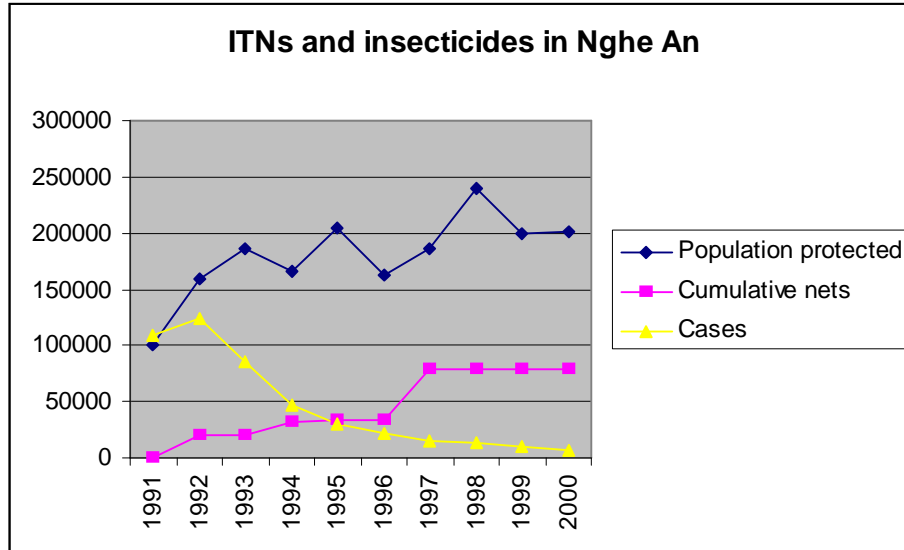


Table 10: Insecticides available in Nghe An, 1991-96

	1991	1992	1993	1994	1995	1996
Permethrin	50L.	500L.	1430L.	2581L.	2600L.	2900L.
Vectron				198kg	1251kg	
ICON			200kg	400kg	270kg	720kg
Deltamethrin			650kg	300kg	200kg	

ITNs have probably played a key part in the success of malaria control, however, not as technical elements *per se*, but as the "stuff" of the socialization of malaria and the joint actions of health, malaria and political systems. The campaigns to re-treat nets (those distributed by government and those acquired in the market) and the IEC activities and materials concerning ITNs are the most visible and regular interaction between the malaria control program and the communities. In this sense, ITNs are the lynchpin of social mobilization for malaria in the current situation of very low morbidity and mortality. ITN campaigns are the engine of continued attention to malaria. The other necessary elements of malaria control surveillance and effective response to outbreaks as well as the capacity for evidence-based adaptation in changing situations-- benefit from this on-going and visible preventive action. It is interesting to think about whether long-lasting treated nets would benefit the control program in Viet Nam or not. One former senior malaria control officer interviewed made the provocative statement that the insecticide-focused ITN

program in Viet Nam was little changed from the old residual spray activity: dominated by the delivery of insecticides through a campaign mode.

The ITN program, however, seems to have been the driving force behind the significant expansion of effective IEC in Viet Nam.

#### The program changed to one of malaria control along the lines of the Global Strategy

In addition to the economic upswing, increased resources for health and for malaria, expanded access to effective treatment, renewed political commitment, and community-based prevention which all began in the early 1990s and contributed to the sharp reductions in malaria morbidity and mortality, there was a change in leadership and direction for the program after 1990. The leadership of NIMPE developed flexibility and "intelligent" responsiveness in the malaria control program. These qualities are among the important lessons from the success in Viet Nam, not only in the early 1990s, when the reductions in morbidity and mortality were largely accomplished, but also over the last several years, as the malaria situation has continued to evolve and present new challenges.

Many of the strengths of the malaria control program in Viet Nam have been discussed already. A capacity for collection, analysis and use of information is another necessary strength. The ability for problem identification, evidence gathering and the development and implementation of solutions can be applied to specific needs such as the recognition and response to outbreaks. But it also enables the program to modify objectives and strategies as the malaria situation changes. In the first half of the 1990s the primary objective was reduction of malaria mortality. And that was accomplished. After careful review and analysis of the situation in 1995/96 the objectives shifted to continued reductions in morbidity and building of sustained control. At present the main elements of the program are described as 1) strengthened ability for people to protect themselves from malaria; 2) malaria control in primary health care, including engagement of the private sector; 3) strong surveillance and response; 4) integration of malaria with social and economic development; and 5) sustained political commitment.

Another necessary strength that the program exhibits is its practical sensibleness, which is manifest in several spheres, perhaps most noticeably in the approach to the private sector, as almost everywhere a major player in treatment of malaria. The strategy is clear. Private providers are engaged, and explicitly held responsible for seven commitments:

- To follow the official treatment guidelines (which include a chapter specifically for private providers);
- To refer severe cases;
- To use legitimate diagnostic methods, especially rapid tests
- To use proper sources for drugs to ensure quality and to prevent selling of the free government drugs;
- To participate in campaigns carried out in response to outbreaks or other needs;
- To register with the authorities; and
- To report malaria cases.

There is an explicit reciprocal, contractual understanding between health authorities and private providers, as there is between malaria and political authorities and between health workers and community members. The benefits and the roles and responsibilities for each side of the partnership are clear and somewhat formally agreed.