GOVERNMENT

SOCIALIST REPUBLIC OF VIETNAM

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NATIONAL STRATEGY
FOR MALARIA CONTROL AND ELIMINATION
IN THE PERIOD 2011-2020 AND ORIENTATION TO 2030

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PART I

BACKGROUND

In 2007, the World Health Organization (WHO) has recommended a new strategy that is global malaria elimination. This new strategy with the aim of interupting the local malaria transmission in a sustainable way.

At the Geneva Conference in 2008, WHO recommended that countries with malaria endemicity should consider to implement malaria control and elimination strategy in each country itself: (1)In areas with active control measures, when the slide positive rate (SPR) is less than 5% of the total fever cases, will move to the pre-elimination phase; (2)To carry out the malaria elimination phases in the areas (district or province) with the SPR< 0.01per 1,000 population at risk/year, the duration for each phase is not limited.

By 2009, 82 countries worldwide have conducted the malaria control strategy; 27 countries have carried out the malaria elimination programme (of which 8 countries have conducted the pre-elimination phase, and 9 in the phase of prevention of malaria re-introduction); 95 countries and states were certificated by WHO for free from malaria.

In Vietnam, the Malaria Eradication Program was carried out in the North since 1958 – 1975 including the preparation phase (from 1958 - 1961) and attack phase (from 1962-1964). Up to 1964, malaria was reduced by 20 times. The malaria eradication program was maintained during the Vietnam War in the North, along with the malaria control and eradication in liberated areas in the South until 1975. After the reunification, malaria situation in the nationwide was unstable, the number of malaria cases and deaths increased as a result of the war aftermath and so many other causes. Since 1976, Vietnam has shifted from malaria eradication to the malaria elimination strategy without deadline. Since 1987, malaria has quickly and severely reintroduced in most of provinces in the mountainous and coastal areas, with approximately 80% of the population living in the malaria endemic areas (57 millions of people). In 1991, there were 144 malaria outbreaks in the whole country, with nearly five thousand deaths and more than one million malaria cases.

In 1979, WHO recommended countries with malaria endemicity to implement malaria control strategy. In 1991, Vietnam shifted from malaria elimination to malaria control strategy, and the malaria control program has been one of the projects under the National Health Program for control of social and dangerious diseases and HIV / AIDS so far.

Vietnam is one of the countries has successfully implemented the malaria control program, with great achievements since 1991 after shifting from the malaria

eradication to malaria control program: Malaria was significantly reduced, even no local malaria cases reported in many provinces and cities in recent years. The number of outbreaks decreased gradually, and there was no malaria outbreak nationwide in 2010. 20 malaria deaths and 53,876 cases were recorded in 2010. Malaria mortality rate/100,000 population was 0.02, reduced 89.5% and 99.7%; Malaria morbidity rate/1,000 population was 0.61, reduced 84.1% and 96.4% as compared with those in 2000 and 1991. 28 provinces in the North and the South have reduced the number of malaria cases and deaths for 10 years (2001-2009) and 6 provinces have recorded no malaria death for 4 years (2006-2010).

The result of malaria epidemiological stratification in 2009 showed that the number of communes and population in malaria endemic areas was reduced significantly as compared with the malaria epidemiological stratification in 2003: The number of malaria endemic communes in 2009 was 2.678, reduced 12.8% (3.072 communes in 2003). The number of high malaria endemic communes was 341, reduced 55.8% (771 communes in 2003), the number of moderate malaria endemic communes was 810, reduced 19.2% (1,003 commune in 2003). The number of population living in malaria endemic areas was 15,279,489, reduced 17.7% as compared with 18,563,244 in 2003.

The result of malaria epidemiological stratification in 2009 showed that 62.7% of districts(437/697 districts) (if calculated unit is district) of 16 provinces, and cities have no malaria endemicity. These 16 provinces were in the phase of prevention of malaria re-introduction (according to WHO indicators for malaria elimination phases), after 3 years under supervision if there is no indigenous case then they would be recognized and certificated by WHO for malaria elimination. There is 190 districts in 34 provinces in the nationwide (if calculated unit is province) with low malaria endemicity and 70 districts with high and moderate malaria endemicity.

The scale of malaria has been narrowed, focusing mainly in the provinces of the Central and Central Highlands, the Southeast region, and provinces bordering with China (Yunnan Province), Laos and Cambodia.

In order to move forward to malaria elimination phases as recommended by WHO, at least 40 provinces and cities will have eliminated malaria by 2020, and by 2030 malaria will have been eliminated nationwide. The development of the malaria control and elimination strategy is very necessary, contributing to the cause of health care and protection for the population, especially the poor people living in the mountainous and remote areas, and to the socio-economic development of the country.

PART II

ACHIEVEMENTS OF MALARIA CONTROL UP TO 2010

I. MALARIA SITUATION IN THE WORLD AND REGION

By 2008, malaria has spreaded to 108 countries: Around 208 million malaria cases and 767 thousand deaths in Africa; 1 million malaria cases and one thousand deaths in America; 9 million malaria cases and 52 thousand deaths in Eastern Mediterranean region; about 24 million malaria cases and about 40 thousand deaths in Southeast Asia. An estimation of 2 million malaria cases and about three thousand deaths in Western Pacific region (WHO data in 2008).

Malaria situation in Western Pacific region by the early years of the 21st century has improved as compared with it in the late 20th century, but still rather complicated in some countries like Papua New Guinea, Cambodia, Solomon Islands.

Number of malaria cases and deaths in Southeast Asia countries in 2008: Cambodia had 46,637 cases and 209 deaths; China had 16,650 cases and 23 deaths; Laos had 19,676 cases and 13 deaths; Malaysia had 9,215 cases and 29 deaths; Papua New Guinea had 1,474,117 cases and 628 deaths; Philippines had 23,998 cases; Solomon Islands had 612,811 cases and 21 deaths; Vanuatu cases 237,343 cases and 1 death due to malaria (WHO data in 2008).

Two bordering countries of Vietnam, Laos and Cambodia had high malaria mobidity (over 3 deaths/1,000 population in 2008). In particular, *Plasmodium falciparum* resistant to Artesunate was identified in the bordering areas with Thailand.

II. ACHIEVEMENTS OF MALARIA CONTROL IN VIETNAM

1. Malaria situation before 1991

The Malaria Eradication Program was implemented in the North from 1961-1975. After 3 years of implementation, the rate of malaria parasite/slice detected in 1964 decreased by 20 times as compared to which in 1958 (5.6%). Until 1975, the number of malaria confirmed cases was 5/10.000 populations.

Malaria eradication program was implemented nationwide from 1976-1990: Since 1976, malaria has increased in many parts of the country due to the aftermath of the war and other causes, such as resource constraints, low development of socio-economy, weak functioning of the health care networks, big movement of population, as well as technical problem (drug-resistant parasites, exophilic vector...). In 1980, malaria cases increased in many provinces in the mountainous and coastal areas, with 1,138 deaths and 511,557 malaria cases nationwide.

From 1980 to 1990, Vietnam continued to implement malaria eradication program without deadline while the country had a lot of difficulties in socio-economy, degradation of local health care networks. Malaria slowly reintroduced to most of provinces in the mountainous, midlands and coastal areas. In 1991, there

were 144 malaria outbreaks nationwide, with over 1 million malaria cases and nearly 5,000 deaths due to malaria.

2. Malaria control implementation in Vietnam from 1991 to 2010

a) Achievements of malaria control

Since 1991, Vietnam has implemented malaria control strategy and the Malaria Control Project has been a priority project under the National Health Targeted Program so far. With government attention and investment as well as efforts and determination of staff of the health sector, malaria control in Vietnam has made remarkable achievements. Malaria has been reduced over the years:

After 10 years of intervention: The number of malaria cases fell 73.1% as compared with those of 1991 (1,091,251 people); the number of malaria deaths decreased 98.5% as compared with those of 1991 (4,646 people), only 2 malaria outbreaks (within village) which reduced 98.6% as compared with that of 1991 (144 outbreaks).

After 20 years of intervention, the malaria control project has achieved and over-fulfilled the targets of the Government as stated in the Decision No.108/2007/QD-TTg dated of 17/7/2007 of the Prime Minister: By 2010, there is no malaria outbreak, 20 deaths and 53,876 malaria cases recorded nationwide. Malaria mortality rate per 100,000 population was 0.02, reduced 89.5% as compared with that of 2000 (148 people). Malaria morbidity rate per 1,000 population was 0.61, reduced 84.1% as compared with that of 2000 (293,016 cases). Malaria confirmed cases per 1,000 population was 0.19. From 2000 up to present, 10 million to 12 million people living in malaria endemic areas were protected by insecticides free of charge, of which 1,2 million - 2 million people were protected by IRS and 9,5 million - 10 million people were protected by ITNs. 1 million -2 million doses of antimalaria drugs were free of charge distributed annually.

These above data confirmed that the government and local authorities developed appropriate objectives, targets with proper and highly effective malaria control measures. However, to achieve the goal of malaria elimination nationwide up to 2030, it is necessary to have further investment from the government in both human resources and other inputs, as well as the coordination of other ministries, sectors and community (especially people living in malaria endemic areas) in malaria control and elimination.

b) Funds for malaria control

Budget for malaria control comes from two sources: State budget and international supported projects (World Bank loans and ODA projects).

- State budgets: The annual budget for malaria control through the National Targeted Program on prevention of some social, dangerous diseases and HIV/AIDS is more than 65 billion VND (From 2001 to 2009: 664 billion dong).
- International supported projects: From 2001 to present, the malaria control

program has received financial supports from foreign countries and international organizations with a total budget of about 50 million USD, mainly for the following activities: supply of bed nets, insecticides, microscopes; equipment and supplies for malaria diagnosis; vehicles and office equipment; capacity building for health staff at all levels, particularly at commune and village levels; supportive supervision and IEC activities.

3. Lessons learnt in malaria control

- Malaria control project is one of the National Targeted Programme with high commitment, consideration, and budget investment of the Government, the Ministry of Health and the Provincial People's Committee. The great efforts of the malaria specialized team at various levels. It has good functional malaria control system from central to local levels (it is vertical from central to provincial level and from district to village levels it is integrated into the general health system for primary health care). To set up and maintain good operation of the village health networks is a strategic and important solution in providing preventive health services to the community.
- Identify target areas and priorities: Central and Central Highland areas, remote areas and areas far away from main state infrastructures. Combining malaria control with developing sustainable factors to prevent the reintroduction of malaria.
- The appropriate drug policy is available; high effective antimalarial drugs have been studied and produced; and antimalarial drugs have been free and adequately provided up to village level for malaria treatment. Ensure sufficient insecticides for vector control (residual spraying and bednet impregnation) in malaria endemic areas, especially in the high and moderate malaria endemic areas. Enhance malaria surveillance, case management, early detection and control of malaria outbreaks. Study and produce appropriate IEC materials and methods suitable with population at high risk of malaria. Civil-military cooperation in malaria control was a traditional and effective measure, especially the cooperation with border guards in monitoring and implementing malaria control measures in remote and bordering areas.
- Socialize malaria control to draw the attention of the authorities at all levels, and the involvement of related sectors and social organizations in malaria control activities; Communities in malaria endemic areas have participated actively in implementing malaria control measures (spraying, treating bed nets, sleeping under the treated bed nets, purchasing bed nets themselves for their family and personal use).

III. CHALLENGES OF MALARIA CONTROL PROGRAM

1. Social-economic challenges:

- The number of opulation living in malaria endemic areas is still high: more than 15 million people (malaria epidemiological stratification in 2009), most

of them are poor, and living in the mountainous, coastal and brackish water areas, ethnic minority, remote and bordering areas.

- Border crossing to the high malaria endemic areas, especially to Laos and Cambodia where malaria is highly prevalent and drug resistant malaria is available .
- Big movement of population annually from non to high malaria endemic areas for seasonal working purposes, which are out of control of the health sector and makes malaria situation unstable with risk of outbreak at both departure and arrival places.
- Population have habit of working and staying overnight in the forest for agricultural purposes. These population have low rate of using bed net and malaria self-protection measures which leads to high risk of infection.

2. Input challenges

- Lack of doctors for malaria control actities as required. Commune health staff and village health workers in mountainous and remote areas are not sufficient in quantity, unstable, weak knowledge of malaria and lack of funds for operation.
- In some provinces with low malaria endemicity for long time, the local authorities and staff–in charge of malaria paid less attention to malaria control since it is thought that malaria is eliminated thus the supervision and detection of malaria were neglected.

3. Technical problems

- Malaria diagnosis at grass root level is still based mainly on clinical symptoms, patients having fever rarely taken blood slides for parasite examination that leads to late diagnosis and treatment.
- The drug resistant malaria parasites have appeared in many provinces and at different rate, but mostly in the Central Highlands and Southeast areas. Artesunate resistance (a high effective antimalarial drug) was found in Binh Phuoc in 2009 with the rate of 14.6%.
- In the northern provinces, the number of malaria cases and deaths has reduced greatly for many years, but they are still facing with the P. vivax relapse and persistant malaria. Radical treatment of P. vivax to prevent relapse requires many days of treatment (14 days, long treatment course), therefore many patients usually did not take full doses of treatment, that leads to the recurrence of malaria.
- *An.minimus* and *An.dirus* vectors are exophilic (indoor human biting and outdoor resting) which made the IRS and the ITNs less effective. *An.epiroticus* in the southern coastal area is resistant to most of insecticides of Pyrethroid group.

PART III

NATIONAL STRATEGY
FOR MALARIA CONTROL AND ELIMINATION UP TO 2020

I. BASIS FOR STRATEGY DEVELOPMENT

1. Legal basis: Law and legal documents of the Government on Health Sector Development in Vietnam.

a. In 2005, the Politburo issued the Resolution No. 46-NQTW on protection, health care and improvement of the people's health in the new situation.

b. The Law on prevention and control of communicable diseases No. 03/2007/QH12 dated of 21/11/2007 was approved by the National Assembly term XII at the second meeting session, and was effective from July 2008.

c. Master Plan to develop the Health Sector of Vietnam to 2010 and vision to 2020 was approved by the Prime Minister in Decision No.153/2006/QD-TTg dated of 30/6/2006.

d. National Strategy for Preventive Medicine in Vietnam until 2010 and orientation to 2020 was approved by the Prime Minister in Decision No. 255/2006/QD-TTg dated of 9/11/2006.

2. Scientific and practical basis

a) WHO recommended countries with malaria endemicity to launch global strategy on malaria control and elimination:

In 2008, WHO held a conference in Geneva to agree on the global strategy for malaria control and elimination: Malaria elimination is to apply strongly preventive measures to stop malaria transmission by vectors in an identified geographical area; that means the indigenous case is zero, and only imported cases.

Malaria elimination program consists of 4 phases, no deadline is set for each phase, it is basing on the malaria parasite rate/ population in malaria endemic areas.

- ***Active malaria control***: when the SPR is < 5% of total clinical malaria cases then move to the pre-elimination phase. The unit for certification of pre-elimination must be at least the district with population of 100,000.
- ***Pre-elimination phase:*** continue the implementation of active malaria control measures to reduce malaria mortality and the SPR to < 5% of total clinical cases (the SPR < 5% of the total clinical cases is considered equivalent to < 5 positive cases per 1,000 populations at risk).

The data source is from health facilities. The data is confirmed by field visits/surveys carried out at the peak of malaria transmission season, collected from people at all ages having fever within 24 hours at the survey time. The

Pre-elimination Phase is carried out until the SPR <1/1,000 population at risk then move to the Elimination Phase

- ***Malaria Elimination Phase:*** Continue the implementation of active malaria control measures to reduce the malaria mortality, the indigenous positive cases to <1/1,000 population at risk, it means that <100 new positive cases per 1 district with 100,000 population. Data source from health facilities and notification reports. This data is confirmed by field survey during the peak of malaria transmission season.

  The Elimination Phase is conducted until the SPR is zero, it means that zero locally acquired cases per year are found, then move to the Prevention of Re-introduction Phase.

- ***Prevention of re-introduction phase*:** Strengthen and maintenance of the indigenous cases at zero. The data source is from the health facilities, reports and case investigation. After 3 year's maintenance of malaria free status, WHO will check and give certification.

  In 2009, 82 countries carried out malaria control strategy, 27 countries conducted the Malaria Elimination Program (of which 8 countries are in the Pre-elimination Phase, 10 countries implemented the elimination phase, a countries are in the prevention of malaria reintroduction phase); 95 countries and states were certificated by WHO for free from malaria.

b) Malaria control and elimination plan in the Western Pacific region for period 2010-2015.

In the end of 2009, WHO adopted the malaria control and elimination plan of the Western Pacific region for period 2010-2015 with the following objectives: Strengthen and maintain the malaria control achievements in the region, step by step eliminate malaria in areas where possible. By 2015, the indicators/targets must have been achieved as compared with those in 2007 as follows: (1) Malaria death reduced at least 50%; (2) Malaria cases reduced at least 50%; (3) Reduction of P. falciparum parasite rate; (4) Hospitalized malaria cases decreased at least 50%; (5) The rate of malaria parasites fell below 5% in at least 6 countries; (6) At least 7 countries will have stopped malaria transmission in selected areas.

With the following objectives: (1) Improve the program management based on political commitments. (2) Ensure the coverage of appropriate vector control measures for the entire population at risk of malaria. (3) Maximize the use of malaria control services and strengthen the involvement of community in malaria control. (4) Ensure that all people have access to early malaria diagnosis and prompt treatment with combination therapy (ACT) which is effective, safe and with reasonalbe cost provided at public and private health facilities. (5) Ensure that the poor people at high risk of malaria are protected with appropriate malaria control measures. (6) Set up and strengthen the malaria epidemiological surveillance system and ensure

sufficient capacity to respond to malaria outbreak. (7) Speed up malaria elimination activities in countries.

In 2010, China, Thailand, Malaysia, Philippines, Indonesia developed and implemented their national strategy for malaria elimination.

II. GUIDANCE FOR MALARIA CONTROL AND ELIMINATION

1. Malaria is a dangerous disease and heavy burden to the health and life of the population. Malaria has impacted directly on the economic and cultural development of the people in the country. Therefore, malaria control and elimination must be considered as a major and long-term task of not only the health sector but also the government and local authorities, it is necessary to mobilize community involvement in malaria control and elimination.
2. Investment in malaria control and elimination contributes to reduce the disease burden for the people, bring high effectiveness of social-economy, particularly in the mountainous areas, economic disadvantaged and extremely disadvantaged areas.
3. Socialization in malaria control: Mobilize the participation of authorities at all levels, coordinate with related sectors in malaria control, in which the health sector plays a leadership role.
4. Actively implement malaria control activities with high results moving toward malaria elimination following WHO guidances and targets for malaria elimination.
5. Strengthen bilateral and multilateral cooperation, broaden partnerships with international organizations, countries in the region and around the world in malaria control and elimination.

III. CONTENT OF THE NATIONAL STRATEGY ON MALARIA CONTROL AND ELIMINATION

1. Strategic objectives

1.1. Overall objectives.

a) **Goal:** To reduce malaria morbidity to below 0.15/1,000 population, and malaria mortality to below 0.02/100,000 population, no provinces in the phase of active malaria control, 40 provinces are in the phase of prevention of malaria re-introduction, 15 provinces are in the malaria elimination and 8 provinces in the pre-elimination phase by 2020

1.2. Specific objectives.

1) Ensure that all people have better access to early diagnosis, prompt and effective treatment of malaria at the public and private health facilities.
2) Ensure the coverage of appropriate malaria control measures for all people at risk of malaria

3) Eliminate malaria in the provinces with low malaria endemicity. Reduce malaria incidence in the high and moderate endemic malaria provinces.

4) Improve the malaria epidemiological surveillance system and ensure sufficient capacity to malaria epidemic response

5) Improve scientific researches activities and to apply the results of researches in malaria control and elimination activities.

6) Improve the knowledge and behavior change of the people in malaria control so as to actively protect themselves from malaria.

2. Strategic targets/indicators

2.1. Ensure that all people have better access to early diagnosis, prompt and effective treatment of malaria at the public and private health facilities.

- 90% of people with fever living in malaria endemic areas received blood examination for malaria parasites by 2015 and over 95% by 2020.
- 95% of *P. falciparum* confirmed cases treated with high effective antimalarial drug combination therapy (ACT) by 2015 and over 98% by 2020.
- 95% of malaria cases received correct and proper treatment in accordance with the diagnosis and treatment guidance of the Ministry of Health by 2015, and over 98% by 2020.

2.2. Ensure the coverage of all people at risk of malaria by appropriate malaria control measures.

- Households in high and moderate malaria endemic areas have sufficient ITNs/LLINs (on average 2 persons/1 double bed nets) by 2015.
- 90% of existing bed nets retreated with insecticides annually by 2015 and over 95% by 2020 (this rate was 82.8% in 2009).
- Over 90% of households in the area designated for spraying received IRS by 2015 and 95% by 2020.
- The number of communes in high malaria endemic areas reduced 30% by 2015 and 60% by 2020 (this number in 2009 was 325 communes) as compared with malaria stratification in 2009.
- The number of communes in moderate and low malaria endemic areas reduced 30% by 2015 and 60% by 2020 as compared with the malaria stratification in 2009 (734 communes with moderate malaria and 1,598 communes with low malaria in 2009).
- Over 95% of poor households in low malaria endemic areas have sufficient ITNs/LLINs (2 people/1 double bed net) by 2015.
- By 2015, over 85% and by 2020, over 95% of population at high risk of malaria (working and staying over night in the forest...) apply malaria control measures (ITNs/LLINs and other personal protection measures).

2.3. Eliminate malaria in the provinces with low malaria endemicity. Reduce malaria incidence in the high and moderate malaria endemic provinces

- By 2015, at least 16 provinces will have eliminated malaria, at least 24 provinces reached the targets of elimination phase, and at least 10 provinces reached the targets of pre-elimination phase (Appendix 10)
- By 2020, at least 40 provinces will have eliminated malaria and 15 provinces reached the targets of malaria elimination and are in the prevention of malaria re-introduction phase. Only 8 provinces are still in the pre-elimination and elimination of malaria phases.

2.4. Improve the malaria epidemiological surveillance system and ensure sufficient capacity to malaria epidemic response

- 95% of villages have village health workers in charge of malaria control activities by 2015 (it was 92% in 2009).
- Malaria outbreak is detected within 2 weeks from its onset and interventions are carried out and controlled within 1 week after being reported.
- No big malaria outbreak occurs.

2.5. Improve the knowledge and behavior change of the people in malaria control so as to actively protect themselves from malaria

- Over 95% of population in the malaria endemic areas can recall at least 4 key messages on malaria control and elimination by 2015 and over 98% by 2020 (it was 89.4% in 2009).
- By 2015, 85% of population in malaria endemic areas use the bednets the night before the survey and over 90% by 2020 (it was 80.6% in 2009).

3. Main solutions:

3.1. Solutions on policy and social issues

- To include the malaria control and elimination in the social-economic development target of the health sector and provinces. To strengthen the IEC methodology in order to improve the knowledge of the population to involve actively in malaria control and elimination.
- To further research and improve the system of institutions/regulations and policies in malaria control and elimination, to meet practical requirements and consistent with the trend of international integration.
- To promote the IEC activities to improve the knowledge and behavior change of the people, especially those are in the areas at high risk of malaria, on malaria control and elimination. To establish the communicator groups including the VHWs and members of organizations and sectors at village and commune levels.

3.2. Solutions on technical issues

- Early case detection, diagnosis, prompt and proper treatment in accordance with the national guidelines at the public and private health facilities. Develop and sustain the communal microscopic points for early diagnosis and treatment of malaria especially in the areas with artemisinin resistance and at high risk of artemisinin resistant transmission.
- Update the national guidelines on diagnosis and treatment of malaria every 2 years according to WHO guideline and the practical treatment of malaria in Vietnam.
- Ensure sufficient provision of effectice antimalarial drugs, artemisinin combined therapy (ACT) and other antimalarial drugs for all levels, particularly the commune and village levels.
- Provide free of charge LLINs and LLIHNs to the people living in the areas with artemisinin resistance, at high risk of artemisinin resistant transmission, high and moderate malaria endemicity; and poor people in the low malaria endemic areas. To mobilize the people to buy the bednets themselves and use the bednets regularly.
- Carry out the malaria epidemiological stratification. Conduct vector surveillance on their density and distribution. Monitor the insecticide resistant vectors and the restore of vector density. Apply malaria vector control measures. Integration of the vector control management (IVM).
- Set up and strengthen the M&E system from central to grass-root levels Develop the procedures and guidelines on M&E for different levels and improve the capacity for M&E staff at all levels.
- Carry out the proramme evaluation and malaria epidemiological stratification periodically and every 5 years' implementation of the malaria control and elimination programme.

3.3. Scientific researches and application of the research results on malaria control and elimination.

- Priority is given to the research on antimalarial drugs for malaria treatment and malaria treatment schedules. Research on appropriate and high effective vector control measures.
- Enhance the technical transfer and exchange of experiences and expert training with the local and international institutions on malaria control and elimination.

3.4. Human resources and international cooperation

- Strengthen the health care network and improve capacity for staff in charge of malaria control and elimination.

- Increase the investment to ensure sufficient budget for malaria control and elimination including the Government budget and other international supports. Allocate and use of the budget effectively.
- Extend the international cooperation on malaria control and elimination, strengthen the existing relationship and explore the possibility for new bilateral and multilateral cooperation. Priority is given to financial and technical support projects, and transfer of modern techniques.

IV. ACTION PLANS OF THE NATIONAL STRATEGY FOR MALARIA CONTROL AND ELIMINATION

Action plans of the national strategy for malaria control and elimination are implemented at the same time and integrated with each other in 5-year periods:

1. Continue the implementation of the approved National Strategy for malaria control and elimination.
2. Action plan for improvement of early diagnosis and prompt treatment of malaria
3. Action plan for vector control and personal protection against malaria
4. Action plan for IEC on malaria control and elimination: to give the authorities at various levels, related sectors and communities with better understanding of malaria elimination strategy so as to direct and involve in implementing the malaria control and elimination measures.
5. Action plan for malaria epidemiological stratification and evaluation on the effectiveness of the malaria control and elimination programme: is conducted in the whole country to evaluate the quality and the effect of the implementation of the national strategy for malaria control and elimination; malaria epidemiological stratification is to identify the degree of the risk of malaria periodically in order to apply appropriate and effective measures in the implementation of the strategic objectives.
6. Action plan for Artemisinin resistant containment: is conducted in areas with parasites resistant to antimalarial drugs to minimize the development of resistance, the degree of resistance and the spread of drug resistant malaria to other areas nationwide, this is a technical problem that affects the effectiveness of the strategy.
7. Scientific researches in malaria control and elimination.

V. IMPLEMENTATION OF THE NATIONAL STRATEGY FOR MALARIA CONTROL AND ELIMINATION.

1. Implementation periods

a) Period 2011-2015.

This phase focuses on developing projects to conduct the intervetions in order to achieve the objectives and the targets of the strategy by 2015. Interventions are mainly conducted at communes (ward) and villages (hamlet).

- Effective implementation of malaria interventions: continue to reduce the number of malaria cases and malaria deaths, no outbreaks happen in malaria endemic areas based on the malaria epidemiological stratification in 2009. Develop sustainable factors in order to maintain the malaria control achievements.
- Develop and implement malaria elimination plan in 16 provinces of areas at risk of malaria re-introduction, and low malaria for years; and conduct malaria elimination phase in 14 provinces with low malaria endemicity.
- Develop and implement Action Plan for IEC activities on malaria control and elimination so as to provide local authorities, related sectors and communities with better understanding of malaria elimination strategy and involve them in the implementation of malaria control and elimination.
- Develop and implement the Master Plan of development of malaria control and elimination network, prevention of parasitic and vector borne diseases in the nationwide as the assigned tasks in the new situation.
- Develop proposals for international support for malaria control and elimination program to achieve the objectives and the targets of the National Strategy for malaria control and elimination.
- Develop and implement action plan to prevent the development and spreading of Artemisinin resistant malaria parasites in order to mobilize domestic and international resources, apply strong and effective measures to prevent the development and spreading of Artemisinin resistant malaria parasites to neighbouring and other areas of Vietnam.
- Develop and propose appropriate incentives to motivate and encourage malaria health workers, particularly at commune and village levels. Update official documents stipulated on program management, M&E, reporting and information on malaria control and elimination from the central to grassroot levels.

b) Period 2016-2020.

- Based on the results obtained in period 2011-2015, continue to implement the above mentioned action plans but focus on resources to perform strong interventions of malaria control in the remaining malaria endemic areas of the country.
- Review, draw lessons learned and scale up malaria elimination program to 16 new provinces in the low malaria endemic areas of period 2011-2015 and reach the indicators of malaria elimination phase; Evaluate and acknowledge 14 provinces which have reached the targets of malaria elimination in period 2011-2015 and will implement measures for prevention of malaria reintroduction.

- Review and draw lessons learned from the model "Artemisinin resistant containment", and expand it to areas with persistent malaria endemicity due to drug resistance.
- Carry out malaria epidemiological stratification for interventions and evaluate the effectiveness of the action plans for malaria control and elimination in 2019-2020 (program review).

2. Responsibilities of related Ministries/sectors and local authorities in the implementation of the National strategy for malaria control and elimination.

1. The Ministry of Health provides direction to the Provincial Health Services, the centers for malaria control at provincial and central levels to assist the People's Committee at various levels on the implementation of concrete activities of the National Strategy for malaria control and elimination for the period of 2011 - 2020 and orientation to 2030; carrying out program monitoring and evaluation, organizing periodic review meeting and reporting to the Ministry of Health for final report to the Government.
2. The People's Committee of the provinces and cities is responsible for direction and implementation of the contents and the action plans of the National Strategy for malaria control and elimination for the period of 2011 - 2020 and orientation to 2030 in their provinces. To develop and identify the objectives for malaria control and elimination in the social-economic development plan of the province; to allocate budget for malaria control and elimination program, to provide additional human resources, facilities and materials for the units in charge of malaria control and elimination activities. For the highly and moderate malaria endemic provinces: to carry out strong intervention measures to reduce malaria mortality and morbidity and no malaria outbreak occurs. For the low malaria endemic provinces: to concentrate in implementing the malaria control measures, step by step to carry out effectively the phases of the malaria elimination.
3. The Ministry of Information and Communication in cooperation with the Ministry of Health gives direction to the Agency of Information and Communication at various levels for IEC on malaria control and elimination so as the population can protect themselves from malaria, especially in the malaria endemic areas, the target groups at high risk of malaria, and to invest budget for developing the IEC programs on malaria control and elimination.
4. The Ministry of Education and Training in coordination with the Ministry of Health (MOH) and related agencies promotes the IEC activities in order to improve the knowledge and behavior of the school teachers, pupils and students in the schools on malaria control and elimination.
5. The Committee for Nationality strengthens its direction to its subordinates to cooperate with the health agencies in charge of malaria control at the same

level to participate in the implementation of the activities of the National Strategy for malaria control and elimination.

6. The MOLISA cooperates with the MOH and other related sector and Ministries to develop policy for those who are carrying out the malaria control and elimination activities.
7. The MPI and the MOF are responsible for timely budget allocation for the implementation of the National Program on Malaria control and elimination according to the budget plan approved annually by the National Assembly.
8. The Ministry of National Defense and Ministry of Public Security are responsible for implementation of the National Strategy for malaria control and elimination for the period of 2011 - 2020 and orientation to 2030 in the armed forces and actively provide budget for the activities of the program; strength the civil-military cooperation in malaria control and elimination in their troop stations.
9. The Ministries of Construction, Industry and Trade, Transportation, Agriculture and Rural Development cooperate with the MOH to develop and implement the malaria control and elimination program for their staff and labours working in the malaria endemic areas, and provide budget for this activity.

VI. BUDGET FOR IMPLEMENTATION OF THE NATIONAL STRATEGY

1. Budget resources

Mobilization and efficient use of funds from the state budget, government bonds, loans and other lawful capital sources

2. Budget allocated

The budget for implementation of the National Strategy for malaria control and elimination in the period of 2011 - 2020 and orientation to 2030 is about 1.673 billions VND.

The Ministry of Planning and Investment and the Ministry of Finance allocate the budget for implementation in accordance with the Budget Law.

The Ministry of Health and the Provincial People's Committees are responsible for allocation of the budget of the health sector and provincial contribution for malaria control and elimination according to annual workplan of the units.

PART IV

ORIENTATION OF THE NATIONAL STRATEGY FOR MALARIA CONTROL AND ELIMINATION IN VIETNAM TO 2030

1. By 2030, malaria is eliminated nationwide:

- Continue to carry out the on-going implemented action plans for malaria control and elimination effectively;
- Strengthen the management of malaria control and elimination activities in order to fulfill the national and international commitments, enhance and maintain the inter-ministerial coordination for the malaria control and elimination program;
- Ensure sufficient budget for malaria control and elimination in the provinces still suffering from malaria endemicity.

2. Monitor, supervise and evaluate progress of malaria elimination annually and after every 5 years.

The program must be reviewed and assessed annually and after every 5 years to draw lessons learned for developing objectives and workplan for the coming year practically and feasibly and ensure the schedule of the approved workplan.

Annex 1. Budget for malaria control and elimination to 2020

Currency: million VND

Year	Budget estimation			
	Total need	Budget allocated by government	Local budget	Additional budget*(mobilization from other sources)*
2011	577,000	105,000	2,468	469,532
2012	347.000	115,500	2,591	228,909
2013	264,000	127,050	2,720	134,230
1014	349,000	139,755	2,856	206,389
2015	352,000	153,730,5	2,999	195,271
2016	330,000	169,103,55	3,149	157,747
2017	397,000	186,013,905	3,307	207,679
2018	349,000	204,615,2955	3,472	140,913

2019	346,000	225,076,8251	3,646	117,277
2020	337,000	247,584,5076	3,828	85,587
Total	3,648,000	1,673,429,583	31,036	1,943,534

- Budget estimation to 2020 is 3,648 billion VND, of which:
  + Budget allocated by government: 1,673 tỷ đồng (45,8%)
  + Local budget: 31,036 tỷ đồng (0,85%)
  + Mobilization from other sources (international supports...): 1,943,534 billion VND (53,4%).

Basis for budget estimation allocated by the government: the Government budget allocated for the national malaria control project in 2010 was 94 billion VND, budget for coming year will be added 10% to avoid annual inflation.

Annex 2. Data on malaria cases, malaria deaths and outbreaks from 1990 – 2010

Year	No.of malaria cases	Morbidity /1,000 population	No.of death	Mortality /100,000 population	No.of outbreaks
1990	902789	13.68	2,911	4.41	85
1991	1,091,251	16.23	4,646	6.91	144
1992	1,294,426	18.91	2,658	3.88	115
1993	1,111,452	15.96	1,054	1.51	19
1994	857,999	12.11	604	0.85	8
1995	666,153	9.25	348	0.48	3
1996	532,860	7.28	198	0.27	1
1997	445,200	5.99	152	0.20	11
1998	383,311	5.08	183	0.24	4
1999	341,529	4.46	190	0.25	8
2000	293,016	3.77	71	0.19	2
2001	257,793	3.28	91	0.12	1
2002	185,529	2.33	50	0.06	0
2003	164,706	2.04	50	0.06	2
2004	128,622	1.57	24	0.03	0
2005	99,276	1.19	18	0.02	5

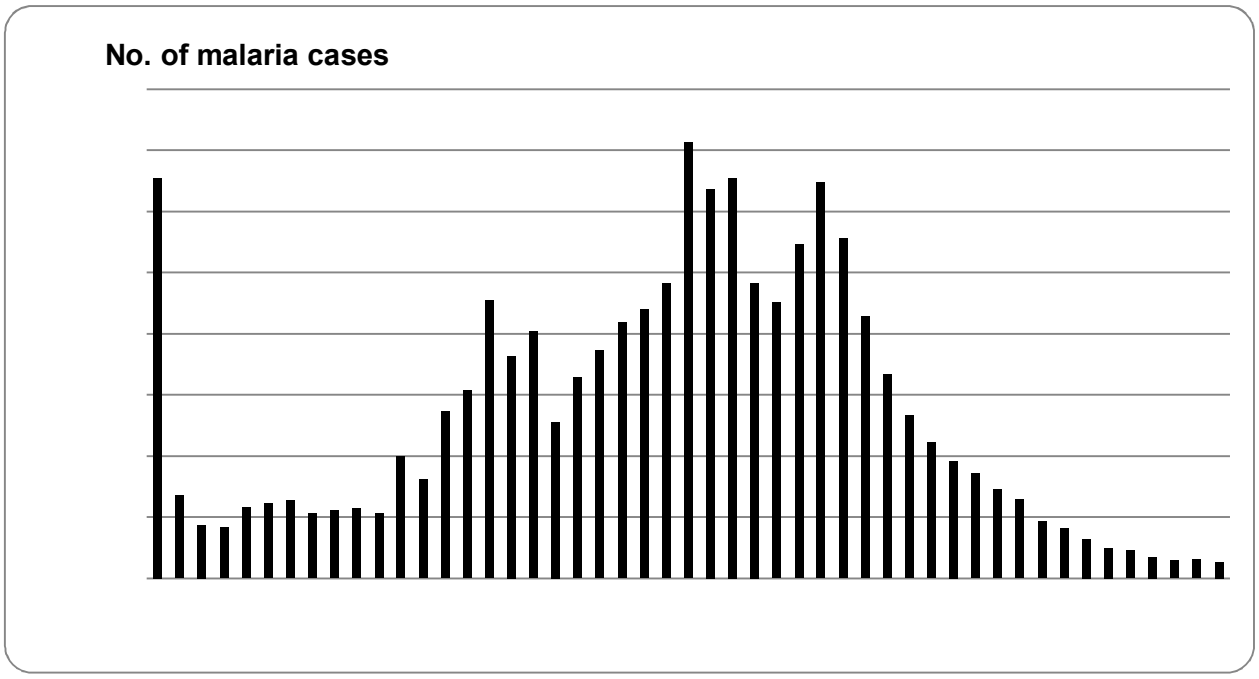
2006	91,635	1.08	41	0.15	1
2007	70,910	0.83	20	0.02	1
2008	60,426	0.70	25	0.03	1
2009	60,867	0.69	27	0.03	0
2010	53,876	0.61	20	0.02	1

Data source: Annual review reports of the National Malaria Control Project .

Annex 3. List of provinces, cities having no malaria deaths in 10 consecutive years (2001-2009)

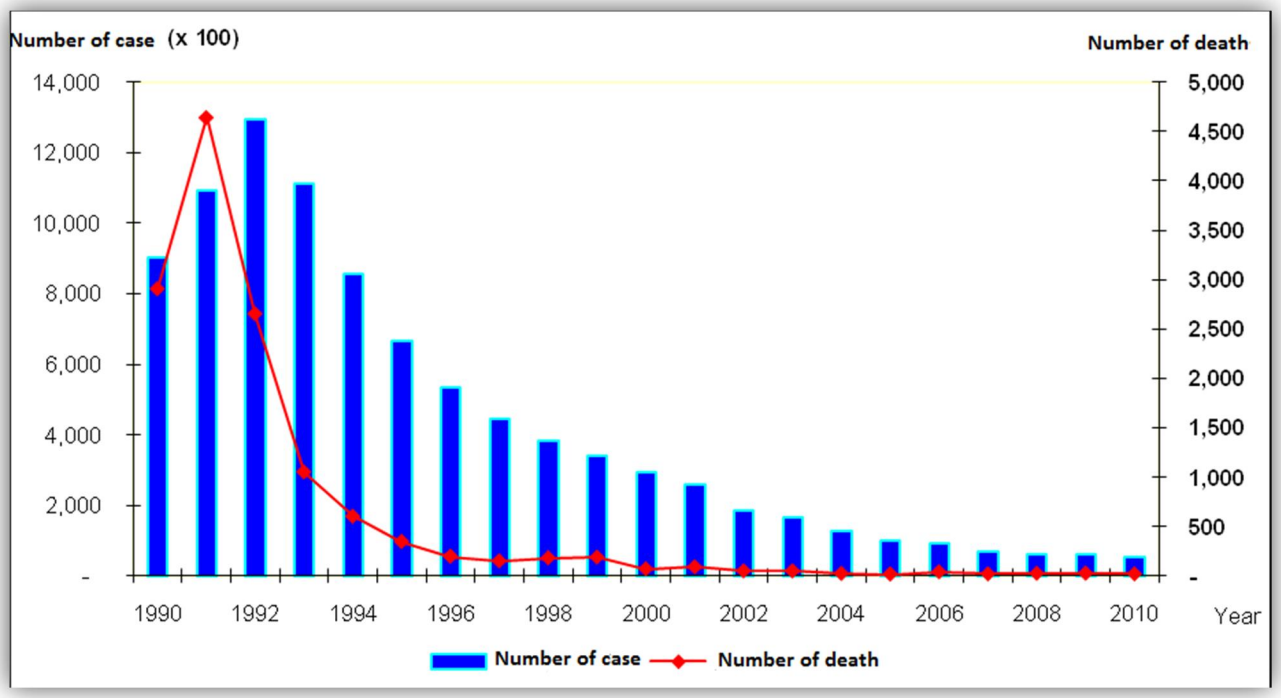
No	Province	No	Province	No	Province
1	Sơn La	10	Bắc Ninh	19	Hà Nam
2	Lào Cai	11	Bắc Giang	20	Nam Định
3	Yên Bái	12	Phú Thọ	21	Hà Tĩnh
4	Hà Giang	13	Vĩnh Phúc	22	Đà Nẵng
5	Tuyên Quang	14	Hà Tây (cũ)	23	Đồng Nai
6	Thái Nguyên	15	Hà Nội	24	Long An
7	Cao Bằng	16	Hải Dương	25	Tiền Giang
8	Quảng Ninh	17	Hưng Yên	26	Vĩnh Long
9	Hòa Bình	18	Hải Phòng	27	Cần Thơ
				28	Cà Mau

Annex 4. Malaria morbidity from 1962 to 2010



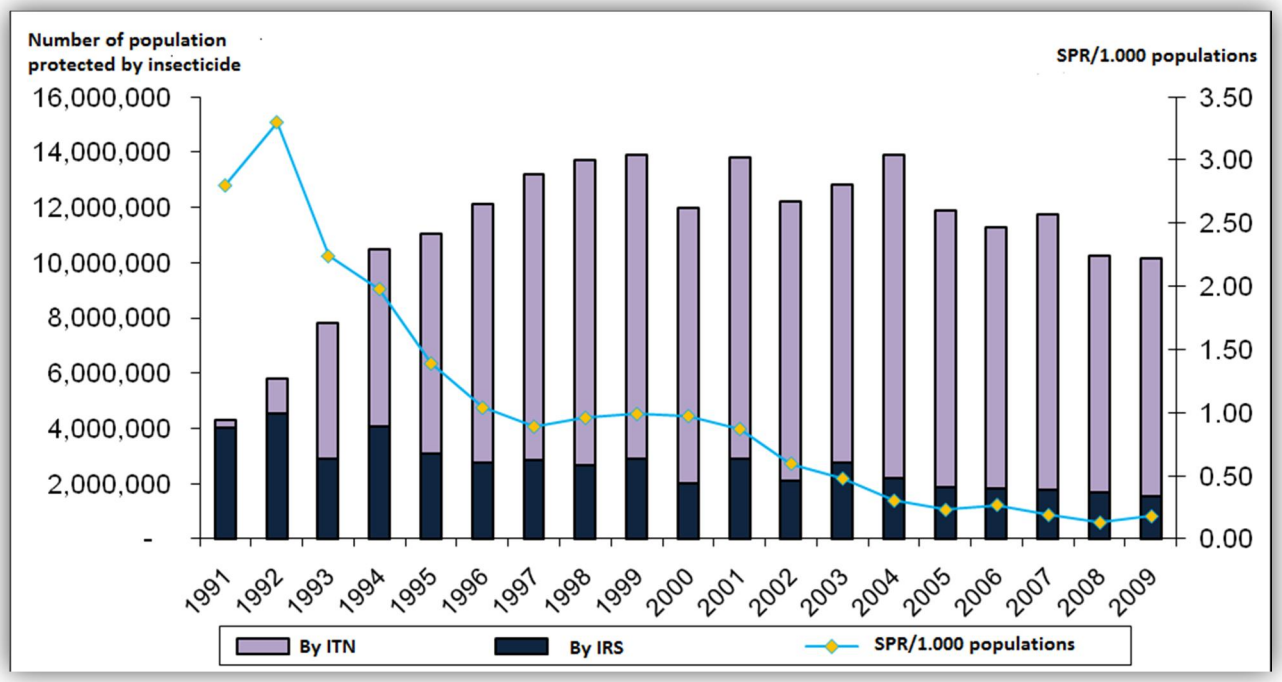
Data source: Annual review reports of the National Malaria Control Project .

Annex 5. Malaria morbidity and mortality from 1990 – 2010



Date source: Annual review reports of the National Malaria Control Project .

Annex 6. The number of population protected by insecticide from 1991 – 2009



Data source: Annual review reports of the National Malaria Control Project .

Annex 7. The number of population protected by insecticides from 1991 – 2009

Year	Total population protected by insecticides	Population protected by IRS	Population protected by ITNs
1991	4,305,786	3,998,485	307,301
1992	5,817,855	4,552,188	1,265,667
1993	7,829,045	2,893,886	4,935,159
1994	10,457,878	4,043,216	6,414,662
1995	11,059,862	3,081,218	7,978,644
1996	12,138,439	2,747,631	9,390,808
1997	13,189,076	2,830,974	10,358,102
1998	13,688,200	2,637,915	11,050,285
1999	13,881,601	2,873,831	11,007,770
2000	11,991,725	1,984,018	10,007,707
2001	11,891,397	1,876,525	10,014,871
2002	11,282,512	1,799,865	9,482,647
2003	11,749,657	1,767,840	9,981,817
2004	10,239,652	1,659,873	8,579,779
2005	10,162,182	1,544,329	8,617,853
2006	11,282,512	1,799,865	9,482,647
2007	11,749,657	1,767,840	9,981,817
2008	10,239,652	1,659,873	8,579,779
2009	10,162,182	1,544,329	8,617,853
2010	9,877,500	1,544,553	8,333,079

Data source: Annual review reports of the National Malaria Control Project

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Annex 8. Definition of malaria epidemiological stratification for interventions in 2009

- Zone I - non malaria endemicity: plains or mountainous areas 1,000m above the sea level in the north and 1,500m above the sea level in the Central Highlands and the south; no local transmission; no indigenous cases but there is possibility of imported cases.
- Zone II - Prevention of re-introduction: former malaria endemic areas but stopped malaria transmission; no indigenous cases within 5 years from 2004 to 2008, but there may be imported cases. If the whole district is located in this zone then it is in the prevention of re-introduction phase
- Zone III - low malaria endemicity: low hills with bushes, mountains at 800-1.000m height in the North, coastal brackish water area; with local malaria transmission and malaria vectors; number of malaria cases is lower than 5/1,000 population.

  If the malaria parasite rate (SPR) of the whole district is lower than 1/1,000 population, then it is in the malaria elimination phase. If it is from 1 to less than 5/1,000 population, then it is in the malaria pre-elimination phase.
- Zone IV - moderate malaria endemicity: hilly forest, coastal brackish water, jungle, thin forest with bushes and industrial trees; with local malaria transmission and malaria vectors; the malaria morbidity is from 5-10/1000 population/year; the number of confirmed cases is more than > 5/1000 population at risk of malaria. If the district is located in this zone, then it is implementing active malaria control measures.
- Zone V - high malaria endemicity: the mountainous forests, southern forests; jungle and forest edges, industrial tree forest; with local malaria transmission, and malaria vectors; the number of malaria cases is more than > 10/1000 population/year. If the district is located in this zone then it is considered to be implementing active malaria control measures.

Results of malaria epidemiological stratification for interventions in 2009

Malaria epidemiological zone	No. of commune	%	Population	%
Zone I – without malaria transmission	5,636	50.7	54,530,178	62.5
Zone II – at risk of malaria re-introduction	2,798	25.2	17,393,146	19.9
Sub-total	8,434	75.9	71,923,324	82.5
Zone III - low malaria	1,527	13.7	10,537,391	12.1

endemicity				
Zone IV - moderate malaria endemicity	810	7.3	3,538,437	4.1
Zone V - high malaria endemicity	341	3.1	1,203,661	1.3
Sub-total	***2,678***	***24.1***	***15,279,489***	***17.5***
Total	**11,112**		**87,202,813**	

Data source: Report on malaria epidemiological stratification of the National Malaria Control Project.

Annex 9. Classification of district according to phases of National Strategy for Malaria Elimination in 2009

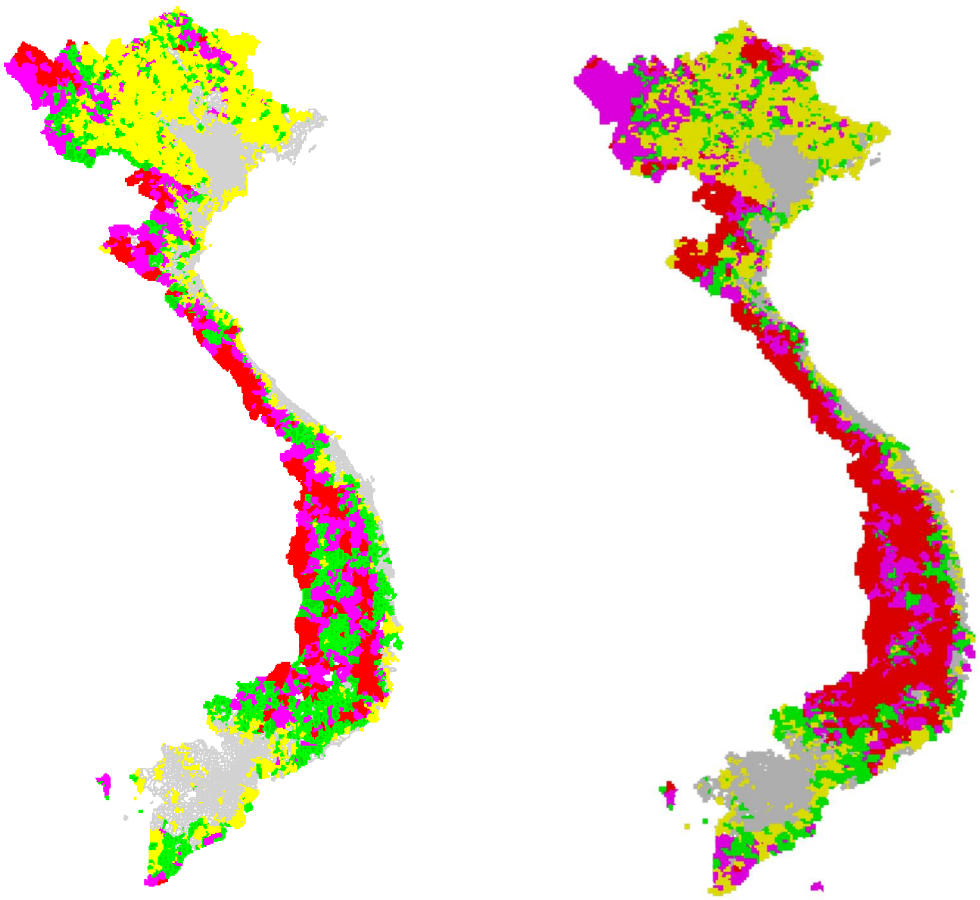
Malaria elimination phases (Main criteria for evaluation)	**Nationwide**	**North**	**Centre and Centre Highlands**	**South - Lam Dong**
Number of districts with the SPR ≥ 5/1,000 population at risk of malaria: *Active malaria control phase*.	13 (1.9%)	0	12 (7.5%)	1 (0.5%)
Number of districts with the SPR from 1 to <5/1,000 population at risk of malaria: *Malaria pre-elimination phase.*	57 (8.2%)	4 (1.2%)	44 (27.7%)	9 (4.2%)
Number of districts with the SPR < 1/1.000 population at risk of malaria: *Malaria elimination phase*	190 (27.2%)	72 (22.1%)	66 (41.5%)	52 (24.5%)
Number of districts with non indigenous cases: *Prevention of re-introduction phase*	437 (62.7%)	250 (76.7%)	37 (23.3%)	150 (70.8%)
TOTAL	**697**	**326**	**159**	**212**

Table 10. Malaria endemicity in 2009 and 2003*

Malaria epidemiological zone	No. of communes			Population		
	2003*	2009	Increased/ Reduced	2003*	2009	Increased/ Reduced
Zone I - without malaria transmission	4.534	5.636		42.620.426	54.530.178	
Zone II – At risk of malaria reintroduction	2.923	2.798		18.485.308	17.393.146	
Sub-total	*7.457*	8.434	*Increased 13,1%*	*61.105.734*	71.923.324	*Increased 17,7%*
Zone III - low malaria endemicity	1.298	1.527	Increased 17,6%	9.949.025	10.537.391	Increased 5,9%
Zone IV - moderate malaria endemicity	1.003	810	Reduced 19,2%	5.540.104	3.538.437	Reduced 36,1%
Zone V - high malaria endemicity	771	341	Reduced 55,8%	3.074.115	1.203.661	Reduced 60,8%
Sub-total	*3.072*	*2.678*	*Reduced 12,8%*	*18.563.244*	*15.279.489*	*Reduced 17,7%*
Total	**10.529**	**11.112**		**79.668.978**	**87.202.813**	

Note: Data of malaria epidemiological stratification for interventions in 2003*:*:Lê Khánh Thuận and et al.*

Annex 11. Geographical map of malaria epidemiological stratification for interventions



2009 2003

- Area without malaria transmission
- Area at risk of malaria reintroduction
- Low malaria endemic area
- Moderate malaria endemic area
- High malaria endemic area

Annex 12. List of 16 provinces to implement and achieve the targets of malaria elimination by 2015

No	Province	No	Province
1	Hà Nội	9	Nam Định
2	Hải Phòng	10	Vĩnh Long
3	Thái Bình	11	An Giang
4	Bắc Ninh	12	Cần Thơ
5	Bắc Giang	13	Hậu Giang
6	Hưng Yên	14	Long An
7	Hải Dương	15	Tiền Giang
8	Hà Nam	16	Trà Vinh

By 2020, 34 provinces will achieve the targets of malaria elimination

Basing on the malaria epidemiological situation in period 2011-2015 to select provinces having low and stable malaria situation, and with appropriate conditions such as Lai Chau, Dien Bien, Son La, Yen Bai , Ha Giang, Tuyen Quang, Thai Nguyen, Bac Kan, Cao Bang, Lang Son, Quang Ninh, Hoa Binh, Phu Tho, Vinh Phuc, Ninh Binh, Thanh Hoa, Nghe An, Ha Tinh, Quang Binh, Thua Thien Hue, Quang Ngai, Binh Dinh, Dakk Lak, Lam Dong, Dong Nai, Binh Duong, Tay Ninh, Ba Ria-Vung Tau, Ho Chi Minh city, Ben Tre, Soc Trang, Kien Giang, Bac Lieu, Ca Mau.

Annex 13. Implementation phases of malaria elimination