

A QUALITATIVE ASSESSMENT
Of
The ethno medical perspectives on intestinal parasite infections
In Vietnam

*A Case Study in Ky Tan, Dien Lu communes of Ba Thuoc District
and Phu Loc, Minh Loc communes of Hau Loc District
Thanh Hoa Province*

Hanoi, 7/2002

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Abbreviations

CHS	Commune Health Station
DHC	District Health Center
DL	Dien Lu Commune
EPI	Expanded Program on Immunization
FGD	Focus Group Discussion
ID	Identification
IEC	Information, Education and Communication
IP	Intestinal parasite
KT	Ky Tan Commune
MCH/FP	Maternal and Child Health/ Family Planning
MoH	Ministry of Health
ML	Minh Loc Commune
TB	Tuberculosis
PATH	Program For Appropriate Technology In Health
PHC	Primary Health Care
PL	Phu Loc Commune
UNFPA	United Nation Population Fund
USSR	Union Of Soviet Socialist Republics
VND	Vietnam dong
WHO	World Health Organization
WU	Women's Union
YU	Youth's Union

Foreward

Infection with intestinal parasites is very common in rural Vietnam, with rates of Ascariasis approaching 100% amongst children aged 2 and above, and *Trichuris* and hookworm infections also highly prevalent. Although burdens of infection are usually light - moderate, the complications thereof are well known. In particular, it is widely believed that intestinal parasite infections are partly responsible for Vietnam's well-recognized high rates of child malnutrition and maternal anemia.

What is much less clear is why these rates of infection are so high in a society whose public health indicators are otherwise well above those of nations with comparable per capita income levels.

Recurrent, population-based treatment of intestinal parasites can diminish the prevalence and burden of infection in at-risk communities, but high rates of reinfection are well recognized. These have been attributed to weak economic development and persistence of environmental and behavioral risk factors.

To our knowledge, no research has looked at these risk factors in Vietnam in the ethnological and sociocultural context in which they prevail. Is it simply lack of knowledge or economic reality that results in the very poor hygienic practices that place communities at high ongoing risk for reinfection? Or do local beliefs about intestinal parasites or the environment result in these known risk factors being accepted? The researchers in this report sought to answer these questions.

Vietnam has for some time now been focusing on child malnutrition and has set targets for improvements in the relevant indicators. Amongst the measures it is seeking to implement is the regular administration of antihelminthics to at-risk populations, particularly children. This research has informed this effort by identifying other efforts, namely the redefining of community beliefs and related attitudes and practices, to which health authorities must also give priority in the fight to reduce rates of intestinal parasite infection in this nation.

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Acknowledgements

The work described herein was based entirely on a proposal for funding prepared by Ms Hanne Alsbirk and Dr David Hipgrave, with suggestions from Dr Tony Stewart. Ms Alsbirk's and Dr Stewart's inputs were made during consultancies they did for PATH and the Macfarlane Burnet Centre for Medical Research (now The Burnet Institute) whilst working on the project "Strengthening Immunisation and Malaria Control in Viet Nam", managed by Dr Hipgrave and funded by the Australian Agency for International Development. This project was a partnership between the Burnet Institute, the University of Melbourne and PATH, and included a major component on the treatment of and public education on intestinal parasite infections. Dr Hipgrave provided regular input during the process of implementing the research reported here, and assisted us in the preparation of this report.

The activities reported were funded by PATH from an internal funding source, available through a generous grant from the Bill and Melinda Gates Foundation.

Input to the proposal was also made by staff at WHO in Hanoi, the University of Melbourne and at PATH in Seattle.

We conducted the work with the assistance of the staff and leaders of the health services in Ba Thuoc and Hau Loc districts of Thanh Hoa, and of course the local people there. Permission to include the photographs we took there was given by these groups, for which we thank them.

We gratefully acknowledge all these sources of funding and other support in the development and conduct of this project.

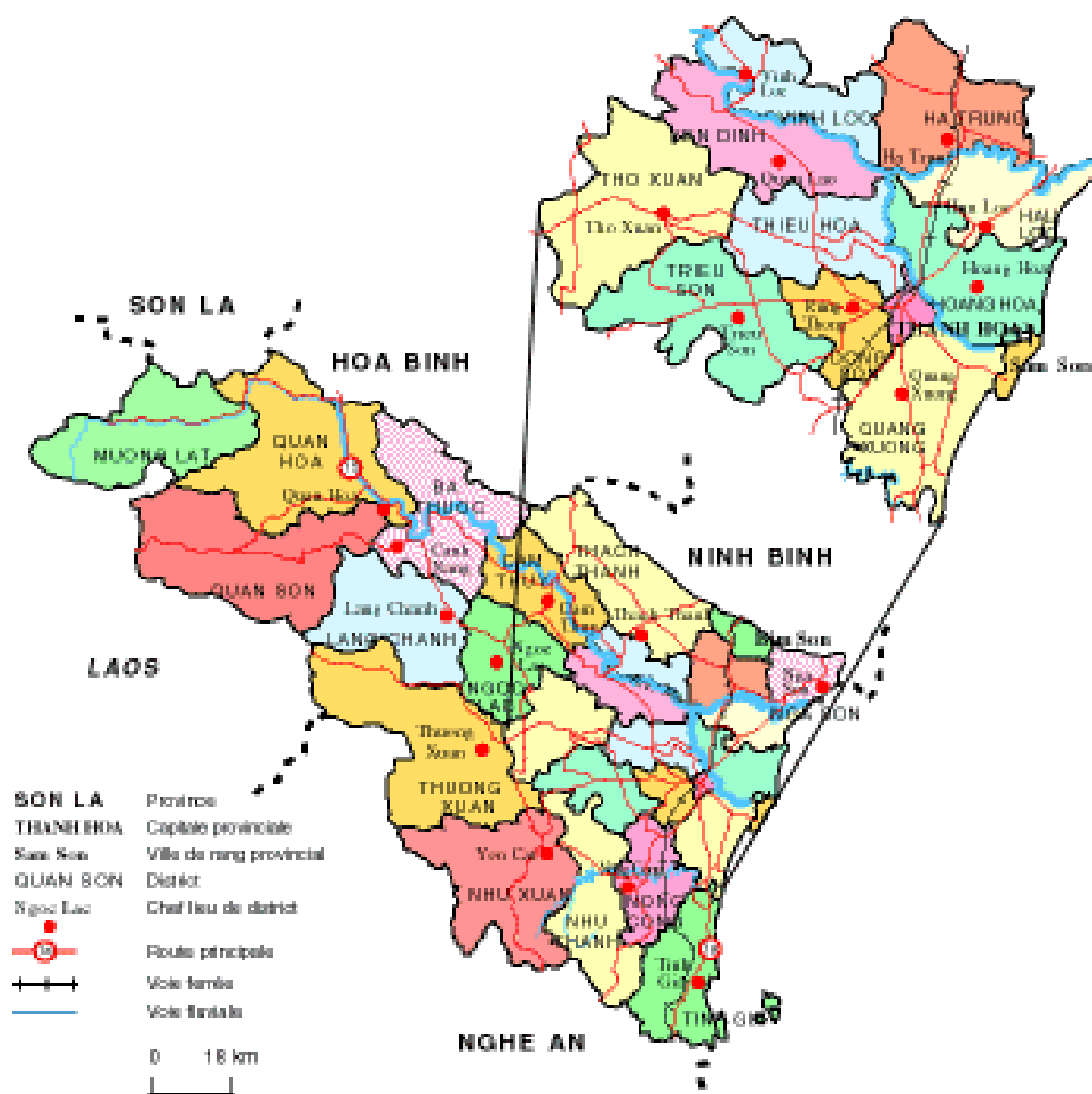
Thank you!

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MAP OF THANH HOA



Chapter 1

BACKGROUND OF STUDY SITES

This research was carried out in four communes of Ba Thuoc and Hau Loc districts of Thanh Hoa Province. These communes were Dien Lu, Ky Tan, Minh Loc and Phu Loc.

1. OVERALL BACKGROUND

Thanh Hoa is one of very few localities throughout the country that have coastal areas, plains, the midland and the mountains. Thanh Hoa covers 11,168-sq.km in the gateway area linking north Vietnam with the central part of the country. Two thirds of its natural area is mountains and midlands. Forests cover 7,119-sq.km. The province has vast plains with plenty of alluvia from Ma and Yen Rivers, which are ranked among the largest deltas in Vietnam, behind the Red River Delta and the Mekong River Delta. Coastal areas stretch over 102 km with flat terrain. Water territory covers 17,000-sq.km, thus offering favorable conditions for expanding aquaculture and seafood exploitation. With three coastal resources areas, of plains, midlands and mountains, the province possesses advantages for developing agriculture, industry and other services. These include the processing of agricultural forestry and aquatic products, the production of construction materials, petrochemical refining and the tourism industry.

However, livelihood is based chiefly on rice cultivation and fishing. Eighty percent of the provincial population lives off agriculture. Rice production in the province in 2001 was 1.33 million tons of food, up 8.8% against 2000. Thanks to the new rice varieties, the rice yield is 6.5-7 tons/ha but Thanh Hoa is still listed among poor provinces in Vietnam. In 1999, 140,026 households were considered as hungry and poor in the provincial wide. Thirty percent of the hungry and poor families are living in the mountainous areas. The per capita GDP is of only 75% of that nationwide, meanwhile, the provincial authorities are still poor in management skills. The provincial average economic growth rate was 8.15% in 2001. The per capita gross domestic product (GDP) reached US\$319 in 2001.

Cultural, social, educational and healthcare activities have been gradually developed both quantitatively and qualitatively. In 1997, the province completed the program for eradicating illiteracy. The percentage of hungry and poor households was reduced to 19.94% in 2001. The provincial healthcare system has progressed. In 2001, 51.27% of provincial communes had doctors working in medical stations (including 255 community doctors and 68 doctors coming from provincial and district-level hospitals) while the rate in the mountain districts is 47.1%. Nearly 83% or 4,776 of the total 5,759 villages had community medical staff.

1.1 Geography and climate

Thanh Hoa Province is located 153 km South of Hanoi. Thanh Hoa is one of the poorest regions in Viet Nam. Although the industrious Vietnamese build their own houses and grow their own food, the extremely rocky terrain in this area makes agriculture difficult.

Like most of the provinces on the north central coastal of Vietnam, Thanh Hoa lies in the tropical and monsoon climate zone with four seasons. It has a diversified terrain with mountains, plains and seashores. Thanh Hoa is lying in the connection between the south and the north, therefore, it experiences the transition climate between the north and the south: winter has little cold, and summer is hot. The average annual temperature is 23 – 24 degrees Celsius (73.40F - 75.20F) in the plain and hilly region, 20 in the mountainous region and drops further at the Viet-Lao border. The highest temperature is 40 degrees Celsius and the lowest is 4 degrees Celsius. The tropical monsoon climate brings cold winters. Rains and typhoons are concentrated in August, September, and October.

1.2 Demography

Thanh Hoa Province

Thanh Hoa is surrounded by Hoa Binh, Ninh Binh, Nghe An, Laos, and the East Sea. Administratively, Thanh Hoa is divided into twenty-seven districts, towns and city, eleven of which locate in the mountains. The total population of the province is 3.6 million, 1.9 million of who are of the working age. Thanh Hoa is the second largest population nationwide, after Ho Chi Minh City. The population density is 331 people/sq.km. Thanh Hoa accommodates ten ethnic minority groups. Many ethnic groups live in this area, including the Kinh, Muong, Thai, H'mong, Dao, Kho Mu and Tho.

The annual population growth rate is 1% with the life expectancy at birth is 69.4. The crude birth rate in Thanh Hoa province is 21.3‰ and the infant mortality rate is 41.7‰¹.

Two project districts

Ba Thuoc is located 130 km of Thanh Hoa City. The population in Ba Thuoc district is 99,880 in 18,618 households. The population growth rate is 1.6%². There are three ethnic groups living in this mountainous area. Muong people live in the south and the east of the district representing 46.4% of the total district population; Thai people live in the west and the north making up 37.6% of the total population; and the Kinh people make up the remaining 16%.

¹ Note on Statistical Data Use in Vietnam Human Development Report- 2001

² Reported by Ba Thuoc District People's Committee, April 25, 2002

Ky Tan commune – Ba Thuoc district

Three thousand-six hundred and ninety people are currently living in seven hundred and forty-two households in Ky Tan. Ninety-eight percent of them are Thai. The Muong makes up only 2%. Living in a poor mountainous commune, the number of hungry households is approximately 340. The cultivated land is very limited while most inhabitants rely on rice cultivation and bamboo planting. The average cultivated area is 720 sq-m/person with the food product per person at 330 kg/per year³. This commune has no market where local people can exchange their products or buy the necessary home belongings. Both Thai and Muong live far from the centre of Thanh Hoa province, therefore, their access to the new rice varieties or education is limited. Local dialect also a barrier to them in communicating information or new technology. In the whole commune, there are 15 TVs and one telephone only. The main means of transportation is the riding of motorbikes and walking.

Dien Lu commune – Ba Thuoc district

Dien Lu is quite different from Ky Tan in both its demography and geography. There are 1,211 families with 6,042 people living in the commune. The majority is King, making up 50% of the population and Muong is 45% while the Thai represents 5% of the population. There are 1,841 children between the ages of 0-18 years. Dien Lu is a lowland commune in a mountainous district, therefore, it is the main source of vegetable provision for Ba Thuoc district. The main income of the family comes from vegetable plantation. There are approximately 335 households which are considered as hungry and poor, this makes up 27.66% of the total population. There are 252 TVs and 900 radios in this commune. Like in Ky Tan, the means of transportation in Dien Lu is motorbike.

The cultivated land is 17 sq-km this is not enough for rice cultivation. Local people go to the market every two days to sell their agricultural products and vegetables to other communes in the district.

Hau Loc district is located 150 km of Hanoi and 25 km of Thanh Hoa City. The coastal areas stretch more than 6km. The total district population is 178,742 in 38,461 households. The majority people group in this district is Kinh.

Phu Loc commune – Hau Loc district

Currently, 7,469 people of 1,837 families are living in Phu Loc and the major people group is Kinh. People of working age often do jobs related to agriculture, fishing and construction. Children at age of 0-18 years old are 2,228. There is no household being considered as hungry. However, 216 families are classified as poor. TVs and radios are popular to the local people and they have better access to information and communication thanks to the telephone network in the commune.

³ Reported by Ky Tan Communal People's Committee to Path

Minh Loc commune – Hau Loc district

The population in Minh Loc is rather high in comparison with other communes located along the coast in Hau Loc district. The total population is 11,955 people in 2,410 families. Kinh is majority people group in this commune. Access to the telephones, TVs and radios is easy to local people. The population is rather young with 4,267 children at age of 0-18 years old.

1.3 Socio-cultural characteristics

The Kinh, Muong, Thai, H'mong, Dao, and Tho live together in Thanh Hoa Province. Therefore, the culture of people in Thanh Hoa is a combination of all their cultural backgrounds.

People in Thanh Hoa possess characteristics common to all northern people. Living near streams and rivers, finding food from different sources and settling permanently, residents in Thanh Hoa mainly rely on the periodical harvesting and fishing. It is the pattern of an agriculture-based economy. Primitive concepts in religion, art, and a desire to reach the perfection were gradually born in working and entertaining activities.

Dishes from goat meat and goat blood curdle are very common. The goats used in Thanh Hoa cuisine are specifically chosen among those raised in the rocky mountains of Ha Trung and Vinh Loc. A chef of Thanh Hoa origin will make a bowl of goat blood curdle into a colorful picture, with the red of blood, green of mint, brown of roast sesame and peanuts. This dish is best served with goat-gall wine. By the way, the best wine should come from Nga Lien or Nga Son, brewed from glutinous rice of the best kind. The second best wine would be that of Quang village. Although made from ordinary rice, the wine from Quang village is quite strong but sweet, obviously thanks to the villagers' professional secrets.

Thanh Hoa is also bestowed with ample seafood reserve, which extends along Hau Loc, Quang Xuong and Tinh Gia coasts. Ranging from sea-crabs of various kinds to lobsters, octopus, cod-fish, etc., the seafood of Thanh Hoa offer a unique flavor which has notably made the local fish-sauce stand out from those made elsewhere.

Two project districts

The Muong, Kinh and Thai live in Ba Thuoc district. Muong marriage customs are similar to the Kinh. When a woman is giving birth to a child, her family surrounds the main ladder to the house with a bamboo fence. The child will be given a name when it is one year old. The Muong hold funerals with strict rules. Muong practice a polytheistic religion and ancestor worship.

Culture: The Muong language belongs to the Viet-Muong group. The popular literature and arts of the Muong are rich long poems, "mo" (ceremonial songs), folksongs, dialogue duets, proverbs, lullabies, and children's songs. The gong is a favorite musical instrument of the Muong, as are the two stringed violins, flutes, drums and panpipes.

Muong handicrafts include weaving, basketry, and silk spinning. Muong women are known to be very skilled at loom weaving.

The Muong hold many ceremonies year round such as the "Going to the Fields Ceremony" ("Khuong Mua"), "Praying for Rain Ceremony" (during the fourth lunar month), "Washing Rice Leaves Ceremony" (during the seventh and eighth lunar months), and the "New Rice Ritual".

Though the Thai live peacefully with the Muong their customs and habits are not the same. The Thai worship their ancestors, the heavens, the earth, ban, and "muong". They also hold rituals to pray for good crops. The Thai live in houses built on stilts. Among the Black Thai, they prefer roofs that are shaped like a tortoise carapace with decorations called "khau cuts" at each ridge. A Thai man first lives with his wife's family for several years until the couple has a child; they then move to the house of the husband's family. The Thai organize funerals as a farewell party to see off the dead to the other world.

Culture: The Thai language belongs to the Tay-Thai Group. They have a valuable legacy of myths, legends, ancient tales, versed stories, and folksongs. They like to sing and recite the "khap" along with the accompaniment of string instruments and a dance performance. Their folk dances such as "Xoe", "Sap", "Han Khuong", and "Con" are reflection of the Thai's unique cultural characteristics.

The Kinh or Viet live in all the provinces but most densely in delta areas and urban centers, their language belongs to the Viet-Muong Group. They carry out cultivation in submerged fields. In the growing of wet rice, they erect dykes and dig canals. The skills of gardening, sericulture, cattle and poultry raising, fresh water and sea fishing flourish within the Viet-Muong people. The craft of pottery was developed very early within the Viet-Muong group.

It is their habit to chew betel, smoke water pipe and cigarette and drink tea. Apart from ordinary and glutinous rice, there are rice gruel and steamed glutinous rice. The Kinh villages are usually surrounded by bamboo groves and many have solid gates. Each village has a communal house that is the place of meeting and common ritual ceremonies. The Kinh live in mud houses.

The husband (father) is the lead of the family. Children take the family name of their father and relatives on the father's side are called "ho noi" (Paternal relatives), and those on the mother's side "ho ngoai" (Maternal relatives). The eldest son is responsible for the worship of dead parents and grandparents. Each family lineage has a temple of forefathers and the head of the family lineage handles common affairs.

In marriage, monogamy is observed. The family of the man seeks marriage and organizes wedding for him, after the wedding party the bride lives with her husband's family.

They worship their ancestors. Dead persons are worshipped every year at the date of death. Their graves are visited and looked after frequently by next of kin. The peasants

hold annual festivals linked with agricultural beliefs. Buddhism, Confucianism, Taoism and imported Christianity are practiced to various extents.

The asset of ancient literature of the Kinh is fairly rich: oral literature (old tales, folk ballads, and proverbs), written literature (poems, writings, books, and edicts). Art sees early development and attains a high level in many respects: song, music, sculpture, painting, dance and performance. Annual festivals are time for lively art activities, most attractive in the countryside.

Those cultural characteristics mentioned above determined behaviors affecting infectious diseases. The habits of eating raw foods or blood curdles creates the open gates for the infection of the helminthic parasite.

1.4 Economic situation

In Thanh Hoa

During the past ten years, Thanh Hoa has seen progress in their economic development, with an average GDP growth rate of 6.6% in the 1991-1995 period compared with around (-1%) and (-8%) in the 1986-1988 period. The province has 55 State-owned enterprises (SOEs), 3 foreign-invested enterprises, 24 private businesses and 31 liability limited and equity companies. Thanh Hoa is calling for foreign investment in the fields of construction materials production, mineral exploitation, agricultural processing, fisheries, forestation, electronics, chemicals, garments, tourism and services.

However, Thanh Hoa is a poor province with a gross domestic product per capita of only USD 291. This is USD 104 lower than the country's average. Export is another weakness of the province with per capita export earning registered at USD 9 as against the country's average level of USD 180. Infrastructure facilities of the province are poor, particularly in highland regions.

According to the Provincial People's Committee, there are 18% of households in Thanh Hoa below poverty line equivalent with 140,026 households

In the two project districts

People in Ba Thuoc mountainous district mainly rely on rice cultivation and partly on animal husbandry and forestation. The annual average agricultural product is 31,175 tons with 5-7% of the annual incensement rate. The Muong, Thai and Kinh have practiced farming for a long time. Wet rice is their main food staple. Other family income is generated through the exploitation of forest products including mushrooms, dried fungus, ammonium, and sticklac. The total district product values USD5,208,000 per year. The number of poor and poorest families is 6,177 equivalents with 1/3 of the total households in the district. The average economic families make up 10% of the total households only. The agricultural product per capita is 280 kg per year. Ba Thuoc is still ranked poor among the mountainous districts in Thanh Hoa.

The economic situation in Hau Loc is brighter than in Ba Thuoc district as Hau Loc is located on the coast. Therefore, besides rice cultivation, local people can increase their family income by fishing. However, the total number of the average economic families counts for only 22.89%. Total number of families ranking as the poor is up to 7,339. There are a high percentage of young people in Hau Loc district migrating to the South to earn living. After the typhoon hit the district in August 1996, 249 fishermen were pronounced dead. The high number of fishing boats that sank lead to a high unemployment rate. The areas of cultivation are limited with high population density, the food shortage often threatens poor farmers when the old rice finishes and the new rice is not yet harvested.

1.5 Education

Despite that Thanh Hoa remains poor its education and training system has made progress and recorded considerable attainments over the past few years. In December 1997, the entire province reached national standards on primary education universalization and illiteracy eradication. Education and training at all levels, from kindergarten, primary, lower secondary and secondary to university levels, are on offer in Thanh Hoa to satisfy various study demands in the province.

The school drop out rate in the mountainous districts is very high. For example the number of students at primary school is approximately 24,500 in Ba Thuoc district while the number of secondary students is 17,500 only. Children are unable to continue their education due to the insufficient finances on the fact of the parents.

Though the province announced the illiteracy eradication, many people who know how to read and write are back to illiteracy because they do not read or write often. Approximately 1,050 people in Ba Thuoc are recorded as illiterate.

1.6 Environment, hygiene and sanitation

In Thanh Hoa province

Like other provinces in the northern region of Vietnam, most of the rural residents in Thanh Hoa have no access to a safe water supply system and are forced to use shallow wells, tube wells, river water and ponds as their water sources. These sources are dangerous to the health of those who use it. Shallow wells are observed to be contaminated with domestic waste water and industrial waste-water discharged in to the rivers. There is 86.6% household using well water in the whole province. The Rural Socio-economic Development plan prepared by the Vietnamese government is focused on the improvement of water supply facilities and sanitary conditions in the rural areas. However, a lack of data and information on groundwater development, water supply facilities and public health and sanitation hampers the progress of the plan.

The 1999 National Rural Water Supply and Sanitation Strategy states “about 50 per cent of households have some forms of latrine (the remaining 50% use of the neighbor’s latrine, or more commonly practice the open defecation. Most latrines are unhygienic, consisting mainly single vault latrines (with the excreta removed regularly for use as

fertilizer) or simple pit latrine. About 20% of households have hygienic sanitation"⁴. The government encourages people to build double-vault composting latrine, which are both sanitary and a source of night soil for the agricultural cooperatives.

In the two project districts

Minh Loc and Phu Loc in Hau Loc district are the densely populated communes with little land to cultivate. Minh Loc and Phu Loc are two coastal communes, therefore, one third of the population is engaged in fishing. The two communes in Ba Thuoc district are in the mountains, where the agriculture, livestock rearing and forestry are the principal livelihoods. In these project areas, night soil is still used as fertilizer, making latrines necessary for its collection and storage. The increasing population also places pressure on land, which has reduced the availability of sites for open defecation.

Lack of financial resources is a major factor that hindered households from having their own latrine. Poor households reported being unable to save or access sufficient cash resources to pay the costs of latrine. During 1999-2000 a pour-flush latrine cost VND500,000 - 2,000,000 to build. A double-vault latrine was VND 300,000 - 700,000. The current minimum daily wage rate for unskilled labor is VND 10,000 - 15,000 per day.

There is a preference for traditional practices of defecation outdoors. This factor was stated to have hindered demand in four communes of the two districts. Two of those communities are located on the sea beaches. The sand dunes on the beach serve as highly preferred defecation sites. The other two communes are located in the mountains and local people's habit is of building latrines in the mountains. When it rains the waste and feces are swept down and rainwater that is collected for daily use often becomes contaminated.

Women in Hau Loc district are exposed to frequent contact with excreta as they generally have to undertake the task of removing night soil from latrines and carrying it to the rice fields, sometimes without the help of any implement. Women also complained that the task makes them feel quite sick, but they feel obliged to do it as it benefits the crops.

There is widespread use of unsanitary latrines because there is frequent demand for human excreta in agriculture. This leads to opening up of septic tanks and leaching pits of vault and pit latrines being maintained in a state that allows easy access to contents at anytime. Covers are removed from pit and vault latrines. Night soil contaminates floors during its removal and the latrines stay dirty and smelly all the time.

Hand washing after defecation is not a common practice, even with just water though the interviewed people are aware that it is a good hygiene practice. Keeping food covered for protection from flies and boiling water for drinking and defecating in

⁴ Selling Sanitation in Vietnam: What works? - Water and Sanitation Program in East Asia and the Pacific, January 2002

toilets instead of in the open were also identified everywhere as preventive hygiene practices.

However, the inconsistencies between awareness and practice are worth noting. While both local people in Ba Thuoc mountainous and Hau Loc coastal districts are aware of proper hygiene behaviors, many households still practice open-air defecation.

According to a recent report by the World Health Organization, "Every eight seconds worldwide, a child dies of a water-related disease. Every year more than five million human beings die from illnesses linked to unsafe drinking water, unclean domestic environments and improper human waste disposal." The report goes on to say, "At any given time perhaps one-half of all people in the developing world are suffering from one or more of the six main diseases associated with water supply and sanitation (diarrhea, ascaris, dracunculiasis, hookworm, schistosomiasis and trachoma).

And the fact is that the access to clean water is not easy to all people in these four rural communes. Many people do not have a reliable source of clean water. In countryside, water supply is not as good as in cities: 50% of farmer households use wells, 25% use rivers or pool-water, 10% use rainwater, the others use small drilled wells and only very small rate use clean water from small water supply stations in the communes. While local people in Minh Loc and Phu Loc communes of Hau Loc district use water from drilled and dug wells, the people in Dien Lu and Ky Tan communes of Ba Thuoc district collect water directly from rivers, streams, and rainwater. Most of these pipe systems are made from a variety of bamboo, which are laid along the base of mountains and lead to water containers placed in village centers for public use. The water sources from all above communities are contaminated in some ways.



Polluted water is used daily by local people

Thai, Muong and Kinh people in mountainous areas have habits to build their still houses in the upper hills; the animals are raised and kept under the still houses; garbage is often disposed of by being thrown into streams or ditches. Rainwater that flows into the streams at the lower land areas brings all garbage, feces and wastes together. Normally, there is no water supply close to their homes so bathing or washing clothes often occurred at streams or rivers.

There is no treatment plant to supply households with water in coastal communes. Water is often collected from the open dug or drilled wells close to homes. There

is no water filter system in Minh Loc and Phu Loc communes.

2. HEALTH

In Thanh Hoa, the government health services are organized at province, district and commune level. Curative and preventive services are available at province and district levels. At commune levels, health workers are in charge of both services. Government health workers do not officially exist at hamlet levels. However, the health network is well structured at hamlet level with health volunteers who are not officially paid by government but the commune people's committee.

In total, Thanh Hoa has 6 hospitals at provincial level, 27 district health centers and 43 general hospitals at district level and 631 commune health stations at communal level.

In recent years, Thanh Hoa has developed a policy that provides free health check ups and treatment to poor people. 100% poor people have been provided with health insurance cards. Thanh Hoa Provincial People's Committee issued a decision 3220/VX-UBTH in 27 November 1995 that allows poor people in mountainous areas do not pay the hospital fees.

2.1 Primary health care program

District level

The district health center is administered by the provincial health station. It is merger of existing health organizations at the district level and includes the district health bureau, the hygiene and prophylaxis brigade, the malaria control brigade, the MCH/FP brigade, the district hospital and the inter-communal polyclinic. The hygiene and prophylaxis brigade provides preventive services including immunization, control of diarrhea diseases, malaria control, control of vitamin A-deficiency and control of iodine-deficiency disorders. The brigade plays the supporting role to the communal health centers in the above-mentioned tasks. The brigade consists of technicians including doctors, assistant doctors and laboratory workers, headed by the vice-director of the relevant DHC.

At Hau Loc district health center

Fourteen national health programs have been implementing in Hau Loc district. The programs that district health center runs most effectively are expanse program on immunization (EPI), TB prevention, family planning, Vitamin A and nutrition. There is no provincial health program being implemented in the district. At communal level, there are 27 health stations with 114 staff of which 15 are doctors, 84 are assistant doctors, and 15 are midwives. The district health center provides approximately 55,000 times the amount of health check-ups per year. According to the annual report in 2001, all commune health stations maintained the drug revolving funds that are able to meet the local people's drug needs and provide primary health care. Depending to each commune, the drug revolving fund is from 2-10 million dongs.

In 2001, 98.2% children were immunized and 74.5% of pregnant women were vaccinated increasing 0.6% the rate of immunization and 2.2% the rate of vaccinated pregnant women in comparison with the rates in 2000. 100% children from 6 - 36 months old were provided with vitamin A. The district health center regularly conduct health education programs to improve the local people's knowledge of the environment, good health practices, HIV/AIDS awareness.

At Ba Thuoc district health center

Ba Thuoc district health center has been implementing only seven national health programs in comparison with Hau Loc district. The most effective programs are EPI, family planning and malaria prevention. However, there are 4 provincial health programs being implemented in the district, of which iodine insufficient activities are most effective. The DHC provides approximately 22,000 times the amount of health check-ups per year.

Communal level

The CHS is the first level of services accessible to the people in the State health network. It has the task of providing technical services in primary health care, early detection and control of epidemic, provision of primary health care and normal deliveries, provision of essential drugs and promotion of family planning methods and health promotion.

Phu Loc commune - Hau Loc district

The health station in Phu Loc commune has four assistant doctors, one nurse and is equipped with seven patient's beds, four small cabinets and one delivery bed. Annually, the CHS provides 7,000 times the amount of health check-ups to local people. Health check-ups include worm infection, trachoma, diarrhea, goiter, malnutrition and malaria.

Under the CHS, there are eleven hamlet health workers who are allowed to examine patients and sell drugs for common diseases in eleven hamlets. However, they are not qualified enough to play this role.

Minh Loc commune - Hau Loc district

One doctor, three assistant doctors and one nurse are working for Minh Loc CHS. This CHS has seven rooms with 190 sq-m in total area. Annually, 8,020 times the amount of health check-ups are provided by CHS. Health check-ups include worm infection, trachoma, malnutrition and diarrhea. Nine hamlet health workers are currently administering under the CHS.

Ky Tan commune - Ba Thuoc district

Ky Tan CHS has four staff three are assistant doctors and one is nurse. They take care of a population of 3,690 inhabitants. The CHS provides 4,126 times the amount of health

check-ups per year to local people. Most health check-ups is relate to worm infection, malaria, goiter and diarrhea. The CHS is poorly equipped with one medical kit provided by UNFPA and one kit for family planning. Seven hamlet health workers are working for the health programs at hamlet levels.

Dien Lu commune – Ba Thuoc district

Currently, there are five assistant doctors working for Dien Lu CHS. They take care of population of 6,042 people in 1,211 households. This CHS is equipped with one medical kit provided by UNFPA. Local people often go to the CHS for check up of worm infection, malaria, diarrhea, goiter, malnutrition, eye diseases and gynecological diseases. Approximately 3,678 times the amount of health check-ups are provided by CHS annually.

2.2 Traditional medicine

The network of traditional medicine in Vietnam has been established from the central to the grass-roots levels. Vietnam Traditional Medicine has gathered some 24,000 formulas as results of accumulated experiences, popular use and/or handed down within families from 14,000 traditional practitioners and private donors. There have been many studies and research to evaluate the results and safety of medicinal herbs and formulas of traditional medicine by means of modern medicine as recommended by WHO.

Thanh Hoa Provincial Health Department regulates that CHS should have its own garden containing traditional herbs. Together CHSs and local communities can set up a model of the family garden where they can plant traditional herbs. The family income can be improved thanks to this model as people can use herbs as vegetable for daily consumption or traditional medicines.

Chapter 2

BACKGROUND LITERATURE

2.1. DEFINITIONS INTESTINAL PARASITE INFECTION

Parasitology is a science which studies many types of parasites of humans, animals and plants. Parasites which infect humans are much more widespread than many people realize. These diseases affect not only poverty-stricken peoples in remote areas of the world, but they also can be important health problems for rich and poor throughout the world.

According to the Life Science Dictionary:

"A parasite is an organism which obtains food and shelters from another organism".

Another definition was mentioned in "Ky sinh trung y hoc" of the Hanoi Medical University:

"A parasite is an organism which depends on another alive organism and obtains food from those organisms to exist and grow".

In medical aspect, a parasite is an organism which depends on human bodies and infects, causes diseases to humans. In this research, we discuss about parasites which inhabit the human's intestine.

Intestinal Parasite infections are caused most commonly by intestinal round worms and tape worms. According to Vecchiato:

"Intestinal parasite infection is a disease contracted by the ingestion of infective eggs from soil contaminated with human feces (in Vietnam called "night soil") or uncooked vegetables contaminated with soil containing infective eggs".

This definition stems from the author working in Vietnam combined with a qualitative medical anthropological study done in Ethiopia in the 1980's and 1990's.

2.2. VARIOUS TYPES OF WORMS

There are about 20 species of helminthes; however, roundworms are a ubiquitous group of parasites occupying a wide range of habitats but with a marked uniformity of structure⁵. Some of the most common parasitic roundworms in humans are⁶:

- € *Ascaris lumbricoides*, the large intestinal **roundworm** that causes **ascariasis**;
- € *Necator and Ancylostoma*, two types of **hookworms** that cause **ancylostomiasis**;
- € *Trichuris trichiura*, the **whipworm** that causes **trichuriasis**;

⁵ Health and disease in developing countries, London: The Macmillan Press Limited, 1994:195-209

⁶ Parasite Roundworm Diseases, NIAID Fact Sheet, Feb. 2001

≠ *Enterobius vermicularis*, the **pinworm** that causes **enterobiasis**.

2.2.1. Ascariasis - Roundworm

The name Ascariasis lumbricoides reflects the resemblance of this intestinal roundworm to the common earthworm known as Lumbricus. It is one of the commonest and most widespread of human infections with an estimated 1300 million cases worldwide⁷ in both temperate and tropical areas. In areas of poor sanitation, everyone may be harboring the parasite. Amazingly, one person can be infected by up to a hundred worms.

Almost more than any other parasitic diseases, human carelessness causes ascariasis. Human feces in streets, fields, and yards are a major source of infective eggs in heavily populated areas. The eggs of ascarids do not infect humans when first excreted by the worm. The eggs are very resistant to extremes of temperature and humidity. They usually are transmitted from hand to mouth, although the use of human feces as fertilizer may also permit transmission of infective eggs by food that is grown in the soil and eaten without being thoroughly washed. The eggs require several weeks to develop and become infective. When a person swallows the eggs, they pass into the intestine where they hatch into larvae. The larvae then begin their journey through the body. Once through the intestinal wall, they reach the lungs by means of the blood or lymphatic system. In the lungs, they pass through the air sacs, are carried up the bronchial tree, and are re-swallowed to be returned to the small intestine where they grow, mature, and mate. The worms become mature in about two months.

A few worms in the intestine may cause no symptoms or may give rise only to vague or intermittent abdominal pain. Heavy infection may cause partial or complete blockage of the intestine resulting in severe abdominal pain, vomiting, restlessness, and disturbed sleep. The heavier or greater the worm infection, the more severe the symptoms are likely to be. Occasionally, the first sign of infection may be the presence of a worm in vomit or in the stool.

A large number of larvae invading the lungs at one time may cause pneumonia. This stage of the disease precedes the intestinal phase by weeks, and the symptoms are difficult to diagnose. Once mature female worms are present in the intestine, however, a doctor can diagnose the infection by finding characteristic eggs in the stool.

Doctors can treat ascariasis successfully with mebendazole, albendazole, or pyrantel pamoate.

2.2.2. Ancylostomiasis - Hookworm

Hookworm is very common in almost all developing countries with about 800 million infections worldwide⁸. Like ascarids, people pick up hookworms as a result of unsanitary conditions. Hookworm eggs are passed in human feces onto the ground

⁷ Parasitic Roundworm diseases, NIAID Fact Sheet

⁸ Health and diseases in developing countries, London: The Macmillan Press Limited, 1994:1995-209

where they develop into infective larvae. When the soil is cool, the worms crawl to the nearest moist area and extend their bodies into the air. They remain there – waving their bodies to and fro – until they come into contact with the skin, usually on a bare foot, or until they are driven back down by the heat.

Hookworm is widespread in those tropical and subtropical countries in which people defecate on the ground and soil moisture is most favorable. People usually get this infection by walking barefoot over contaminated soil. In penetrating the skin, the larvae may cause an allergic reaction. It is from the itchy patch at the place where the larvae entered that the early infection gets its nickname "ground itch." Once larvae have broken through the skin, they enter the bloodstream and are carried to the lungs. (Unlike ascarids, however, hookworms do not usually cause pneumonia). The larvae migrate from the lungs up the windpipe to be swallowed and carried back down to the intestine.

Diarrhea, particularly in person who has never been infected, sometimes starts as the worms mature in the intestines and before eggs appear in the stool. Other signs and symptoms at this stage include vague abdominal pain, intestinal cramps, colic, and nausea.

Scientists have learned that people in good health and on a diet containing adequate iron can tolerate the presence of these worms in small or moderate numbers without having problems. In chronic infections, if the number of parasites becomes great enough, a person can develop serious anemia because of blood loss from the worms attaching themselves to the intestine and sucking the blood and tissue juices.

If humans come into contact with larvae of the dog hookworm or the cat hookworm, or larvae of certain other hookworms that do not infect humans, the larvae may penetrate the skin. But these larvae cannot complete their migratory cycle in humans. Instead, they move just below the skin producing snake-like markings and intense itching. This is referred to as a creeping eruption or coetaneous larva migrants.

Ancylostoma caninum, an illness caused by a particular species of dog hookworm, has been described in Australia. This worm may almost complete its development in the lower small intestine, but produces a severe inflammatory reaction in the bowel, causing abdominal pain, diarrhea, and an increase in certain white blood cells called eosinophils.

A laboratory worker will examine stool specimens to look for and count the number of eggs. If the egg output is large enough – more than 2,000 eggs per gram of stool – the doctor will assume that the infection may cause anemia and start treating the patient.

Once a person has been diagnosed with hookworm disease, a doctor can prescribe medicines such as mebendazole or albendazole. Frequently, the doctor will add an iron supplement to this treatment.

2.2.3. *Trichuriasis – Whipworm*

Whipworm infection is a worldwide infection of warm countries with about 750 million cases in the world and often occurs in the same areas as *ascariasis*⁹. This parasitic roundworm infection of the large intestine often has no symptoms, but a doctor usually can diagnose it by examining the stool and finding whipworm eggs. Heavy infections may cause intermittent stomach pain, bloody stools, diarrhea, and weight loss. The name whipworm comes from the parasite's long, very thin, whip like shape. Fertilized eggs develop outside the body, and an embryonated egg is produced in three weeks in a favorable environment; that is, warm, moist, shaded soil.

Although the incidence of whipworm infection is high, its intensity is usually light. In the United States, the infection occurs principally in warm, moist climates, most frequently among children. People can get infected by accidentally eating whipworm eggs on their hands or in food or drink. Severe infections in young children can result in serious disease with bloody diarrhea and a condition called rectal prolapsed.

Doctors treat whipworm disease most often with mebendazole and albendazole.

2.2.4. Enterobiasis - Pinworm

A pinworm is the most common roundworm parasite in temperate climates – even in areas with high levels of sanitation. Because pinworm infection is spread mainly by children, it is found most often in family groups, day-care centers, schools, and camps.

Pinworms are small, threadlike roundworms found primarily in the colon and rectum. The life cycle of the pinworm – egg, larva, and mature worm – takes place inside the human body and requires from three to six weeks to complete.

Pinworms enter the body when eggs are swallowed. The female pinworm expels thousands of eggs into the environment. Because the eggs are moist and a bit resistant to drying, they may be able to infect someone for several days after being distributed in dust. They can cling to the fingers of children.

Exposure to infective eggs may occur when the person who is infected scratches the contaminated area (the area around the anus where the female worm deposits her eggs) and then transfers the eggs to the fingertips and from there to the mouth. The eggs may be scattered into the air from bed linen and clothing, and can cling to doorknobs, furniture, tubs and faucets, and even food. Although a person may have no symptoms over a long period, episodes of infection may return repeatedly.

Folklore is filled with fantastic descriptions of symptoms and abnormal behavior blamed on pinworm infection. Actually, the symptoms are usually mild and vague. Movement of egg-laden female worms from the anus will often produce itching of the anus or vagina that, in some cases, may become very intense and even interfere with sleep.

⁹ Health and diseases in developing countries

A doctor or other health care worker can diagnose pinworm infection by finding the eggs. The most common way to collect the eggs is a rather simple one involving swabbing the anal area with the sticky side of a piece of transparent cellophane tape. The tape is then transferred to a slide where it can be looked at under a microscope.

Some doctors believe that no treatment is necessary for pinworm infections that have no symptoms. This is because children usually outgrow the infection. Because of the strong probability that small children will get infected again outside the home, strenuous efforts to eliminate the eggs from the household are of little help.

If the doctor does prescribe medicine, all members of the household should take it, regardless of whether they have symptoms. Drugs such as mebendazole and pyrantel pamoate (Povan) are the most useful in treating pinworm infections.

To relieve intense itching that often accompanies pinworm infection; a doctor may prescribe a soothing ointment or cream.

2.3. INTESTINAL PARASITE INFECTION STATUS IN GLOBAL

Intestinal parasite (IP) infections, particularly those due to *Ascaris lumbricoides*, *Trichuris trichiura* and the hookworms *Necator americanus* and *Ancylostoma duodenal*, are considered the most ubiquitous human infection, with global prevalence estimates of 1000 million. Infection can cause gastro-intestinal problems with malnutrition, iron deficiency anemia, delayed mental development in children¹⁰ and the loss of productivity in adults¹¹. The World Bank claims that worm infections impair learning and that helminthes control is one of the most effective strategies to improve health in developing countries¹². Both the World Bank and WHO promote helminthes control programs in developing countries as a cost effective intervention¹³.

The intensity and prevalence of IP infections in humans are related to a variety of ecological, behavioral, immunological, and demographic determinants¹⁴. Transmission is enhanced by poor socioeconomic conditions, deficient sanitary facilities, and improper disposal of human feces, inadequate supplies of water, poor personal hygiene, substandard housing, and lack of health education¹⁵. All these factors correlate with poverty and underdevelopment, so that intestinal parasitizes can be labeled

¹⁰ Anderson, E.N. & Marja L., Anderson, 1975, "Folk dietics in Two Chinses communities, and its imlication for the study of Chinese medicine". In Arthur Kleinman et al (eds). *Medicine in Chinese Culture*, Geographic Health Studies, John E. Forgary International Center for Advanced study in Health Services.

Bundy, D.A.P. & G.F. Medley, 1992. Immuno-Epidemiology of Human Geohelminthiasis: Ecological and Immunological Determinants of Worm Burden. *Parasitology* 104: 105-119

¹¹ Cadriere, Leopold, 1957. *Croyances et Pratiques Religieuses de Vietnamiens I-III*. Paris: Ecole Francaise d'Extreme-Orient

Danish Red Cross, 1999. *Village volunteers and Women's Reproductive Health. A study of the role of village volunteeers in promoting reproductive health in four target communes of the Vietnam Red Cross/Danish Red Cross PHC Project in Thai Binh Province*. Hanoi: Danish Red Cross Field Office

¹² World Bank. World development report 1993: *investing in health*. Washington: World Bank, 1993

¹³ World Health Organization. *Guidllines for the evaluation of soil-transmitted helminthiasis and schistosomiasis at community level: a guide for manager of control programmes*. Geneva: WHO, 1998

¹⁴ Ellen, R.F (ed.) 1984. *Ethnographic Research. A guide to General Conduct*. London: Academic Press

¹⁵ Emerson, Robert M., Rachel I. Fretz and Linda L. Shaw, 1995. *Writing ethnographic Fieldnotes*. Chicago and London: The University of Chicago Press

"diseases of poverty"¹⁶. However, they are also inextricably linked to and shaped by culturally determined perceptions and practices concerning health, hygiene, and disease. Recent anthropological research has demonstrated that infectious diseases do not simply result from an unfortunate mix of ecological and physiological determinants: rather they may be precipitated by specific behaviors, themselves influenced by culturally determined beliefs, practices and social expectations¹⁷.

2.4. INTESTINAL PARASITE INFECTION STATUS IN VIETNAM

In Vietnam, intestinal helminthes are a major health hazard in many rural communities¹⁸. In northern and central provinces, up to 100% of individuals in some areas may be infected with *Ascaris lumbricoides* or *Trichuris trichiura*, whereas in the south infection is lower. In contrast, hookworm infection occurs at moderate to high prevalence levels throughout the country, with no marked geographical trend¹⁹.

Local surveys in Thanh Hoa Province suggest that almost all children are infected with IPs, with at least one of the above species in 88% of children under five, and 95.2% in those aged 5 – 9. Also in Thanh Hoa, PATH's office has identified IP infection in over 95% of children aged 2 – 10, nutritional stunting in 57.7% and wasting in 8%, with a significant association between wasting and helminthes burden. In general in Vietnam, the highest rates are found in rural areas where access to basic health services is poor, and particularly where human faeces are used as fertilizer for growing vegetables. A survey conducted in Hanam province where night soil is routinely used as fertilizer for crops reveals that 83% of participants are infected with *A. lumbricoides*, 94% with *T. trichiura* and 59% with hookworm²⁰. There is clearly an urgent need to prioritize IP control.

Interventions by the Vietnamese MOH to significantly decrease the burden of helminthes are currently haphazard and focus on mass drug treatment and education, rather than control of transmission. Yet apart from some association with particular farming and sanitation practices, little is known of the behavioral and cultural determinants of intestinal-parasite infection in Vietnam. It is well known that children and women of child-bearing age suffer most from helminthes infections, but further research is needed to ascertain if there is underreporting or tolerance of infection, or use of traditional vermifuges by communities themselves, and also what proportion seek modern biomedical treatment. It may be, as recently demonstrated in studies in Africa, that there is a fundamental discrepancy between biomedical and ethno medical perspectives on IP infection in Vietnam.

¹⁶ Gammeltoft, Tine, 1999. *Women's bodies, Women's Worries*. Curzon Press

¹⁷ Hoang Bao Chau et al., 1993. "Overview of Vietnamese Traditional Medicine". In: *Vietnamese Traditional Medicine*. The Gioi Publisher: Hanoi

¹⁸ Nichter, M., 1992. *Anthropological Approaches to the Study of Ethnomedicine*. Amsterdam: Gordon and Breach Science Publisher

Urbani, WHO, *Personal Communication*

¹⁹ *Epidemiology of soil-transmitted nematode infections in Hanam Province, Vietnam*

Toan 1991; Dr Hoang Thi Kim, *Unpublished Observation*

²⁰ *Epidemiology of soil-transmitted nematode infections in Hanam Province, Vietnam*

Chapter 3

ASSESSMENT PROCEDURES AND METHODOLOGY

The main study issues included in this assessment are:

- ∄ Do the local people use conventional anthelmintics to treat intestinal parasite infections (helminthes)? Why do they use these types of anthelmintics or vermifuges, where do people get them and how do they use them?
- ∄ What is the current inadequacy of statistical problems and or how is the situation of acceptance/suffering from the intestinal parasites diseases?
- ∄ Who have been involved in the treatment of worm intestinal infection and how do they treat them? What are the health problems caused by worm infection?
- ∄ What problems are identified in worm infection at the investigated communities?

3.1 METHODS OF STUDY

The qualitative approach was used in this study with the goal to develop the education, communication and prevention programs which are more relevant to Vietnam and other places.

This approach combined two aspects including anthropological and community health aspects as relevant. *The community health approach* was manifested in the following points:

- ∄ Studying the awareness, attitude, knowledge and practice of people in health;
- ∄ Studying the behaviors of local people in utilizing health care services;
- ∄ Studying the behavior in purchasing vermifuges in the country-side;
- ∄ Considering the preventive aspect of health care; and
- ∄ Studying worm infection related problems to give recommendations to the health care program.

The *anthropological approach* was addressed in the following aspects:

- ∄ Studying the health related problems within the local context, mainly to study the local people's concepts through language and significance of health presented by local people);
- ∄ Qualitative study techniques and tools were used to assess the health problems in the local context of community;
- ∄ Analyzing the data within the social-cultural context of community.

The qualitative study techniques were used to assess and study the attitude, behavior, awareness, knowledge, and practice of local people within their socio-cultural context. These techniques included: in-depth interview, focus group discussion, observe participation, observed behavior and some other techniques (information tree, free interview, ranking, set up diagram, etc.).

Techniques used to collect information

In-depth interview

In-depth interview was used as the main method which was conducted in two phases at the households of the selected interviewees.

The study team developed the interview guideline instructions including questions or more precisely, topical subjects which should be addressed during the study. The questions or topics were flexibly changed depending on the specific interviewees and situations.

Focus group discussion (FGD)

A group of 8-10 persons selected by identified criteria (see the details at the next



section). FGD was conducted during the phase 3, after having finished the two phases of in-depth interview. FGD was focused on the questions “why” and “how” to obtain deeper information and explanations relevant to the objectives of the survey as well as findings gathered from the two phases of collecting information by using in-depth interview techniques. The information collected from the FGD is used to check and as a

supplement to the information derived from interviews conducted at the previous phase of the study.

Observation

In this study, two forms of observations were carried out by the study team: i) *observation at households, primary schools, kindergartens, surrounding environment* of investigated points (village, hamlet lanes, paddy field) ii) *observation at pharmaceutical shops* at both CHS and private shop (including at the market). The research team spent much time for this activity during, before and after interview.

At households where the research team conducted the interview, the general household information was collected (income, ethnic, living conditions, kind of house, courtyard, floor, kind of latrine, etc.). In addition to the observation, the researchers drew the diagram of the house location and other sites of hygienic facilities such as latrine, bathrooms, water source, kitchen or cooking place. The main observation was focused on hygienic facilities, water source, and washing activities of family members, how to bath the children, how to prepare and cook meals, as well as observation on the mealtime of the family. However, the research team did not have many chances to observe how the people take their meals. The people were very reluctant to allow strangers observe their mealtime; therefore such observations were not satisfactorily conducted.

At the pharmaceutical shops at CHS and private pharmacy, the research team spent adequate time to carry out this activity.

The observation of surrounding environment of the study area was conducted by research team members. A great deal of information collected in each household by taking notes in hand-writing and by photos.

Setting up the information tree

The information tree was applied by the research team members during the whole study process, from the period of preparation, to field trip, then analyzing the information. Therefore, the information tree was always updated and completed. In this study, the information tree included the main branches such as Knowledge, Attitude, and Practice on treatment of worm diseases. The small branches developed from the main-branch-related issues. In that way, the questions investigated continue to be made clear during the study.

Free interview

The purpose of using this technique is to collect the general information on knowledge, ways of hygienic practices and prevention of intestinal parasite infections at the local communities. The results of these free interviews were used to develop the initial information framework and to provide suggestive directions in designing the semi-structured interview to be conducted in the official phase of the survey.

In additions, some other techniques were used such as ranking: requesting the local people to rank the diseases in priority of danger that according to their perception from the most dangerous disease to the least dangerous. This technique makes an assessment on the relative position of heminthiasis in comparison to other diseases. There were about 10 common diseases existing within the local community including heminthiasis which were written on small pieces of paper, after that the participants ranked in order of priority from the most dangerous diseases to the least dangerous. Two sets were used, one set for common diseases in general and one set for diseases in children.

In the group discussion, the observe participation technique was applied by requesting people in drawing the diagram of worm contamination (facilitated by the researcher team member). This technique helped the group members to participate more eagerly and actively in the discussion.

Another technique to collect information is to build up a “*Box of vermifuge*”. Different samples of vermifuges which are available on the market were collected and put in a box. During the first phase of the survey, the researcher showed the “*Box of vermifuge*” to the participants and requests them to take a look to find out what kind of drugs that they have known and used. The questions on price, time and place of purchases, quality of medicine, date of expiration, etc. can be asked through this method. By using this method, the participants could easily recall how they treated the worm infection themselves and other family members in the past.

Besides, photos were also considered as good information illustrating effectively and impressively the locality, hygienic environment, and the actual life within the communities. Having the records at field sites was indispensable to the qualitative study. The researchers recorded all the observations, comments, remarks, time and content of meetings. These records provided much important information, which complement to the results of the interviews and group discussions.

In addition, the secondary information on the locality (commune/district) was collected (including demographic index, some primary health care indicators including intestinal parasite infection prevention to describe the cultural and social situations and behavior in health care and hygiene in general and heminthiasis control and management in particular) at the communities.

The set of study tools included

- ∓ The basic information sheet for use to collect the statistical data on socio-economic and cultural situations from commune grass-root level to district/province levels.
- ∓ The instructions of conducting in-depth interview and FGD (focusing on married women at reproductive age, women at reproductive age with children under five, married men).
- ∓ The instructions of conducting interview to key officials at district/commune levels and key informants (Head of CHS, Chairwoman of Commune Women’s Union (WU), drug seller/herbalist/magician, teacher).
- ∓ Box of vermifuge samples collected at the locality where the survey was conducted.

The procedures of the survey

Before conducting the official survey, a pre-test study was conducted at one commune of Hau Loc District. During this pre-test study, the free interview technique was applied to adjust and supplement the study issues.

The official survey was conducted in three phases of purely applied techniques of in-depth interview, observation, and some other qualitative techniques. In the first phase, the total number of in-depth interviews was 84 conducted at four selected communes. In the second phase, the research team continued to conduct in-depth interviews at households which were interviewed during the first phase, but limited only at the households which showed interest (42 cases) to collect more in-depth information and to cross-check the collected information. After each phase of study, the information was collected and main findings were primarily analyzed to adjust the questions and study issues for the next phase.

The third phase of study was focused mainly on FGD and in-depth interview of some local key informants. However, for certain reasons (usually due to conflict in their busy schedule) participants were unavailable therefore the interviews were not yet conducted at this stage.

3.2 SAMPLING AND SELECTING THE LOCALITY OF THE SURVEY

The selection of the interviewees and localities of the survey was carried out carefully in consideration to factors such as *geographic* location (mountain, highland/midland/lowland); *ethnic* factor (Kinh, ethnic minorities); *traditional cultivation* practices (vegetable planting/no vegetable planting; utilizing fresh night-soil/not utilizing fresh night-soil, etc.), *life style*, *available information on treatment of intestinal parasite infections* at health care facilities, within the health care system where private health care services and traditional medicine co-exist with the public health care services, etc. One PATH staff member conducted a field trip within the communes in the two districts to select the communes which were relevant to the rational objectives of the survey. The two districts, one mountainous district (Ba Thuoc) and one lowland district at coastal area (Hau Loc) were selected as the locations of the survey. At each district, two communes were selected.

At each commune, one hamlet was selected for the survey. The selection was based on the list of households in the hamlet, and the list of patients in the hamlet who were treated for intestinal parasite infections at CHS/or referred to the hospitals. The sampling was focused on selected households which had the following criteria besides the above-mentioned features:

- ∄ Households with small children (below 10 years old) as compared to households with older children.
- ∄ Households plant vegetable using night-soil as fertilizers compared to households using compost/or not using night-soil

- € Households which had at least one person who was treated for intestinal parasite infections at health facility;
- € Households with pretty good income versus poor households;

The interviewees for in-depth interview at household level were husbands / or their wives. The numbers of samples were determined by basing on the available budget and time. In addition, the key informants from commune level were also interviewed. The groups of in-depth interviewees at commune level include:

- € Husband and aged persons (more than 60 years old) of the household;
- € Leaders of commune (Chairman or Vice-Chairman of Commune People’s Committee);
- € Head of CHS;
- € Representatives from WU (Chairwoman or Vice-Chairwoman)
- € Village health volunteers
- € Drug sellers or primary pharmacist at CHS;
- € Teachers from day care centers of primary schools.
- € Herbalist, traditional medicine physician;

FGD were conducted by dividing into two groups at each commune as follows:

- € Group 1: from 8-10 married persons (04 women and 04 men) at the age of 20-45 years.
- € Group 2: from 8-10 persons (04 women and 04 men) at the age of 50-65 years.

Total number of persons participating in the interviews and the time when the survey was conducted as follows:

Time of conduction		Methods	Number of persons
January, 2002	Phase 1	In-depth interview, observation, box of vermifuges, ranking	84
April, 2002	Phase 2	In depth interview, observation	42
June, 2002	Phase 3	FGD, drawing diagram	08 groups (about 64 persons)
Total	<i>84+ 64 = 148 (out of that there were 42 persons who was involved twice in the in-depth interviews)</i>		

In total, there were about 148 persons who were involved in this survey and the research team members visited 84 households and made observations.

Gift/ fee for interviewees and research ethics

In this survey, some gifts and fees were given to the local collaborators. The photos of households or interviewees were offered to the respective individuals as the favorite gifts, in addition each households involved in the survey received a small gift as a token of sentiments and gratitude of the research team for their enthusiastic participation.

The local collaborators (health care workers, village health volunteers, WU's members) also received a small amount of fee as the stipend for their effective supports in establishing the list of households, informing the interviewees, and working as the guide of the research team to conduct visit to the households.

In addition, the research ethic issues were considered on the voluntary basis for the agreement of persons who were selected to participate in the interview. Prior to the interview, the researcher asked the interviewee if he/she agreed to voluntarily participate in the interview. Most of them accepted to participate in the interviews. There was only one person who refused to answer; this person was excluded from the list of interviewees. The in-depth interview was conducted at interviewees' households to create a comfortable, familiar and private environment for the person. After having finished the interviews in the first phase, the researcher raised the question of meeting him/her again to get further information. All the interviewees were happy and agreed to participate in the second interview as requested.

In a similar way in conducting of the FGD, prior to the group discussion the group facilitator explained the purposes and content of the study, as well as again checking if any of them do not wish to participate in the discussion²¹.

All the in-depth interviews and group discussions were recorded in audio-tapes with the consent of the interviewees and all group members.

Constraints to be addressed during the survey

One of the difficulties to be dealt during the phase three of the survey was the coincidence of Football World Cup 2002. FGD were conducted at collaborators' houses and it was impossible to avoid the neglect of some male participants, some men did not concentrate enough on the discussion and were "on pins and needles" and anxious to go back home to watch football match.

At Ky Tan, a cyclone occurred during the survey, heavy rain hampered the participants to come in due time. One member from the group of young people (20 - 25 years old) came to participate but had to leave early because her house had collapsed due to the cyclone.

In addition, the in-depth interviews with some key officials of health care sector and local authorities were postponed to phase three because a suitable arrangement was

²¹ The interviewees were invited and informed in advance about the purposes and contents of the survey, there were only those who accepted to participate in the survey were involved in the discussions and interviews.

unable to be made in their schedule to meet with the research team members during the first and second phases. Some in-depth interviews were converted into group discussion due to the neighbors visiting the “official’s house” because they were curious as to what the purpose of the health official's visitation was²². These neighbors were very keen on providing their opinions in the study issues such as hygienic environmental issue, customs and habits of community. In another case, instead of only the husband, the interview was conducted with the participation of both husband and wife, because the wife was very much interested in this issue, etc. There were only two or three interrupted cases during the entire survey. In some aspects, these “constraints” became helpful because more information was collected unofficially from community; some information collected from these “random” group discussions was rather interesting and provided many suggestions to the research team to consider.

Due to some technical problems, some interviews were not recorded. The research team member wrote down the interview content as soon as it was finished.

The information collected from the research was kept confidential. All the field notes, observations, audio-tapes, photos, transcribed copies of interview contents were carefully kept by research team members. The survey got the official letter of agreement from the Thanh Hoa Provincial People’s Committee to authorize the study implementation.

Developing the guidelines of conducting interview and group discussion

The identification of methods and techniques to be used for this qualitative study was proposed by the anthropologist during the period of project design in Hanoi, with reference to other research team members’ opinions. The contents of questions/topical subjects of the guidelines of conducting group discussion and in-depth interview were developed by basing on the definition of contaminated intestinal parasites infection and study issues. The guidelines of in-depth interview were designed separately to be relevant to the subject groups (villagers, local authority officials, health care workers, and teachers). Besides, the participation of local collaborators (health care workers, village health volunteers, and women union’s members) all people played an important role. They provided both assistance to the research team to learn about the local situation, and its information. They worked as both guide and the person who introduced the research team to the interviewee/subjects and invited the subjects to participate in the FGD. During the survey, the research team had a very good relationship with the collaborators and got effective support from provincial level to district, commune, and village levels.

A pre-test study was conducted on four women, two men, health care workers and some key officials to assess the contents and questions of the guidelines.

3.3 DATA COLLECTING, PROCESSING AND ANALYZING

²² One of the facts that could make the villagers misunderstood was among the research team, there were some health care workers from district, province levels who were involved in the survey. The villagers thought that they (health workers) came to conduct the medical check-up program, therefore the villagers, especially women of fisher households in Minh Loc were very much interested in this event

As mentioned above, the survey was conducted in three phases, lasting from August, 2001 to June, 2002 (see attachment). The survey was conducted first at remote communes in the mountainous area, far from Thanh Hoa city, and then moved back to the two communes located at coastal lowland area.

After the end of each field trip, the recorded audio-tapes were decoded and transcribed into typed copy. After that, all the information was coded and primarily analyzed. After each phase of study, the main findings were presented in a short report. At the same time, after each phase, the research team discussed carefully the findings and observations collected during the study to adjust and complement the guidelines of questions to be used for the next phase.

After having finished the three phases of the survey, the collected information was analyzed in more depth and discussed among the research team members. The report was made on the results of the three phases of the survey.

Research Team Members

The following members participated in this qualitative study:

- € David Trees Master of Public Health
Country Director of PATH in Vietnam

- € David Hipgrave Medical Doctor, Pediatrician
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- € Pham Thi Van Anh Bachelor of Social Science, Psychologist
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- € Nguyen Hoang Diep Bachelor of Social Science, Journalist
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- € Hanne Albrisk Master of Anthropology in Health
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- € Doan Kim Thang Master of Sociology
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Chapter 4

RESULTS AND DISCUSSIONS

4.1 KNOWLEDGE, AND ATTITUDE OF PEOPLE AND HEALTH CARE WORKERS IN INTESTINAL PARASITE INFECTIONS

4.1.1 Awareness of worm diseases

The statistical data issued by the four CHSs, has recognized that the prevalence of intestinal parasite infections at investigated communes where people planted vegetable using night-soil (Dien Lu and Minh Loc communes) is remarkably higher than the two other investigated communes. The figures are shown in the following table:

Table: Statistical data of the prevalence of intestinal parasite infection

	Commune using night-soil (%)	Commune without using night-soil (%)	District (%)
Ba Thuoc District	8.7 (Dien Lu commune)	0.6 (Ky Tan Commune)	20.0
Hau Loc District	40.0 (Minh Loc commune)	22.6 (Phu Loc commune)	32.0

Source: DHCs of Hau Loc and Ba Thuoc Districts and 4 investigated CHSs, 6/2002

According to the health care workers of CHS, the above prevalence of intestinal parasite infections was calculated on the basis on which cases were treated at the CHS. In the local health care workers' opinions, the real prevalence of intestinal parasite infections in the community must be much higher.

"Presently, the most common diseases are ENT diseases, respiratory diseases, especially sore throat in children. Malaria has been very common in the past few years, but it is allot more controlled now. The study conducted by Mrs. Hoa from central level for a master thesis in 1996 found that 80% of pregnant women were infected with intestinal parasite with a majority being of whipworms and hookworms. Current data is unavailable at this time but this prevalence has not decreased." (Head of CHS where people use night-soil)

"Regarding the parasite infections problem in our community, in comparison to other diseases it's prevalence is very high, in particularly the prevalence of heminthiasis should be on the top of the list, because there are plenty of people who buy anthelmintics." (Head of CHS of mountainous commune)

Attitude towards intestinal parasite infections

In order to study the attitude of people towards morbidity and intestinal parasite infection in particular, the research team presented some common diseases which can occur in both adults and children and requested the people to rank them in order of seriousness. The research team member requested the participants to rank the common diseases in the order that according to them is the most dangerous disease²³. The results showed that there were only a few families which had suffered from and required treatment for intestinal parasite infections and considered IP infection as one of the dangerous diseases. The rest of people who considered IP infection was less dangerous than other diseases such as malaria, pneumonia, liver or stomach diseases, etc. In many cases, people considered that "IP infection is normal". The majority of people ranked the IP infection only as dangerous as the cold or flu which is considered as the mildest illnesses and easiest to cure as well.

The majority of interviewees at the investigated communes considered that helminthiasis is less dangerous than some other diseases.

"The most dangerous disease is malaria, then tuberculosis, the kids could die of pneumonia, and then stomachache and dysentery also can cause death. While, worm diseases do not often cause death...." (Female, Thai ethnic group, KT)

"The most common disease in this commune is malaria, the second is pneumonia, the third is helminthiasis" (Male, CHC, Thai ethnic group, KT)

"The most serious disease is hepatitis, then pneumonia, helminthiasis is also dangerous but if you know how to treat, it is easy to cure." (Male, Kinh ethnic group, ML).

However, in terms of geographic area, the results of the study also showed the difference in ranking the seriousness of common diseases among the people. Most of people living in mountainous area like Ky Tan commune, Ba Thuoc District expressed their opinions that malaria, heart and lung diseases are much more serious illnesses, while according to many people living in the lowland communes like Dien Lu, Phu Loc, Minh Loc, digestive disorders such as diarrhea, dysentery and helminthiasis are also considered as serious and dangerous.

"...the helminthiasis is the most dangerous diseases, because liver diseases are also caused by intestinal worms. Worm can cause other diseases such as malaria, diarrhea, stomachache, cold and flu. Once invaded the body, they eat all nutritious substances which make human beings suffer from malnutrition" (Male, Muong ethnic group, DL).

4.1.2 Concept of people towards intestinal worm and worm contamination

Ways of intestinal worms contaminate

²³ The research team members gave the participants 10 cards with 10 names of common diseases that the villagers have got (according to the information provided by health workers), out of that there was "worm disease", then requested the participants to rank them in order of danger as they perceived

The majority believed that the main causes of intestinal worm diseases are hygienic factors such as eating in dirty conditions, dirty hands, or eating rotten, putrid food. The main factors such as dirty hands, food, and flies were mentioned very often and considered as the main cause of intestinal parasite infections.

One rather important finding is the majority of people did not know that the mechanism of contamination, that infection by intestinal parasites is mainly faecal-oral. Some people even thought that the worm eggs originate from the earthworms, and then become intestinal worms once they are ingested and multiplied in the human body. In addition, flies have been considered as the vector of transmitting the infection.

"The worm first lives outside the body, it is born in the earth, it gives eggs which we can touch, from there it can be transmitted to the kids, it means that our hands and clothes can be in contacted with the eggs... then the flies can carry the eggs and contaminate the food that we eat." (FGD, group of persons aged from 20 to 45 years old, Kinh and Muong ethnic groups)

The people's awareness of intestinal parasite infections at investigated communes was still inadequate. However, most of the opinions were focused on mentioning about the hygiene factor which leads to the IP infections. The differences in family income are not the reason which made the differences in IP infections between households.

"Our body can be infected with intestinal worms by several ways, firstly through the food being contaminated with worm eggs, then when we eat uncooked green vegetable, or with small kids, especially when they try to crawl, if we do not know how to keep them in clean conditions and let them crawl on the earth surface, they can be contaminated with the worms". (Male, Kinh ethnic, PL)

"Any persons, rich or poor, can be contaminated with worms, the main thing is whether you can follow hygienic rules or not. Poor families which have no conditions to take care of clothes, washing, cutting the nails, and safe food can be infected with worms easily. On the contrary, rich families have good conditions to take care of the children, but if their food is dirty, worm infections still occur" (Male, 64 years old, Thai ethnic)

There were different opinions in regarding to way of transmission through the skin. The majority of people do not know this way of transmission. In reality, the local people have not got any information on this issue.

"It is impossible to be infected with intestinal parasite by walking barefooted, we can only be contaminated and get the infection through the eating of food and drinking unpurified water." (Male, Thai ethnic, KT)

"We are sure that worm can penetrate into the body through some ways, firstly if the soil contaminates our feet or hands, we should wash to clean them before eating..." (Male, 48 years old, Thai ethnic group)

In general, the answer to the question "where are the worms from" was varied. Most people answered that worms are "created" from "bacteria", "fly eggs", "worms

naturally existed in the body". Some old villagers believed that human being is born with worm already existed in the body.

"The children get worm when they are one year old, but only one to three worms in maximum. When people are small children, the worms are small, when people grow up, the worms also grow up". (Charlatan, Muong ethnic group, 71 years old.)

"Worms mate and give eggs, these eggs can be passed outside with the stools. Existence of worms in the body is harmful." (Male, 32 years old, Thai ethnic group).

"Worms naturally exist in the abdomen; they have no way of penetrating into the body. People already have one or two worms in the abdomen when they are born" (a woman, 32 years old, Kinh ethnic group).

Food and intestinal worm diseases

At the investigated communes, the meal which contained protein rich food such as fish, and meat is considered as nutritious food. Many people believed that they should have a good meal with vegetables, meat and fresh fish. The "cold" and "hot" food is usually combined to keep the balance and such combination depends on the season and individuals²⁴. Some food is considered as "cold- cool" such as seafood can cause diarrhea if it is eaten too much. While some "hot" food like dog meat, pineapple, mango, and jackfruit may cause constipation or boils if taken in large quantities.

The intestinal worm infections are associated with eating raw (uncooked) food or drinking unboiled water. The raw food (especially those from lowland) people believe can cause worm infections are: raw green vegetable, blood curd, raw fish, raw sweet-potatoes, and raw cucumber. The local people believe that "eating raw food" can "convert into worms". Drinking unboiled water is admitted as possible way of worm infection. However, very few people have related worm infections to hygiene or the possibility of worm eggs contaminating food.

"Dirty living conditions are not hygienic, eating much raw vegetable or raw food is obviously affected with worm problems." (Male, 53 years old, Kinh ethnic group).

Eating raw vegetable and raw fish frequently can cause worms. Eating much sweet food also can get worm. It's what the peasants like us think." (Female, 38 years old, Kinh ethnic group).

"Worm diseases can be caused from taking food and water. People told me that because eating raw vegetable and other raw food as well." (Male, 28 years old, Thai ethnic group)

Moreover, many people believe that eating sweet food such as cake, candy, sugar, sugar cane, etc. can "produce" worms. Their explanation is that children have worms

²⁴ In Vietnam, Galletoft also noticed the differences in perception of "cool" and "hot" food (1996). For instance, meat, especially dog meat, coffee, alcohol, ginger, chilli (hot pepper), etc. are considered as "hot food", while many types of vegetables, fishes are "cold/cool food", some other food such as rice is considered as "moderate, temperate" (refer to Anderson and Anderson 1974, Cadiere 1957)

because they eat allot of confectionary foodstuff like cake and candy. Therefore, some mothers try to restrain or not allowing their children to eat confectionary as a measure of prevention of worm infections.

"... worms like to eat sweet food stuff; if someone eats a lot of sweet food they can get many worms" (Male, Kinh ethnic group)

Knowledge in types of worms

The majority of people who were involved in this survey talked about roundworms as the most common type of intestinal parasites. Pinworms were also mentioned by some people in this survey, some people stated other names such as: hookworm, whipworm, and pinworm but they were confused between small worm and hookworm. In many cases, people relate the appearance of human intestinal parasites with the appearance of the worms that they have seen in animals.

"I just only know roundworms and pinworms. In addition, there are hookworms.... that I have seen sometimes. When pigs or dogs are slaughtered, I have seen some worms in the bowel, the big worm is roundworm, the pinworm is the small one, and the hookworm has a different shape. It looks small too, and has a curved hook like shape. When a stunted pig is slaughtered, there are plenty of worms in the bowel". (Female, 37 years old, Muong ethnic group)

When being interviewed about the knowledge in intestinal parasite diseases, the people at investigated areas only knew the names of worms through some advertisements of vermifuges on the television. There are only a few people said that they had seen it in the newspapers or books.

"The reading of health magazines or newspapers helps me realize that there are many types of worms. I have been told that if we do not wash the hands before eating or do not wear sandals, shoes or slippers, it is very easy to be infected with worms". (Male, 32 years old, Thai ethnic group)

"People are usually infected with roundworm, and pinworm. These two types are the most common infections. Worms live in the digestive tract. Digestive tract begins from esophagus to then extend to the stomach, bowel and so on..." (Male, 39 years old, Thai ethnic group)

The opinions of some old villagers showed that they think roundworm infection is not dangerous. The most dangerous type is hookworm because hookworms suck the blood from the body and are difficult to treat. They usually attach to the wall of the stomach. Other villagers' opinions, expressed that the pinworm is considered as the "child" of the roundworm.

Where do the worms live and what do they like to eat?

At investigated communes, the majority of people who were interviewed replied that worms live in the human bowel; some interviewees thought that worms live in the stomach. There are a few opinions saying that worms live in the bowel but they travel to the stomach to get food (rice, soup, etc...).

"As far as I know, worms live in the intestinal tube, because the bowel is the place where there is plenty of food in the human body. Worms never live in the stomach but only in the intestine..." (Male, 34 years old, Kinh ethnic group)

"Worms live in the stomach, when they are hungry they creep to look for food" (Female, 42 years old, Muong ethnic group)

Another finding which was revealed through the opinions of the villagers is that roundworms are produced from earthworm eggs. They thought that the earthworms mate and lay eggs in the ground, then the eggs disseminate by dust, and are inhaled by human beings. Other opinions assume that hookworms are scared of water, therefore having a regular bath and washing more frequently can reduce the risk of getting hookworm.

"Worm infection is contaminated through the digestive tract, and blood. In the human body, worms live in many organs but mainly in the bowel. In this area, human feces and night-soil are not controlled therefore there are many infected people, it is possible to get infection through the air as well." (Health care worker)

The symptoms of worm infections

Most of the opinions of the interviewees showed that the most common symptoms of worm infections are: different degree of abdominal pain ranging from mild to severe colic pain, intestinal cramps or feelings of *"something creeping, moving"* in the abdomen. Especially, the sign of abdominal pain at hunger time is considered by all interviewees as sign of *"worm is creeping to look for food"*.

"If you get worm disease, when the worms are hungry, they creep to the throat and cause the nausea feeling or they move and stir in the abdomen which makes you painful... Sometimes, some worms can get out of the body through the anus of the children." (Female, 38 years old, Kinh ethnic group)

"The symptoms of worm diseases are abdominal pain, then nausea with watery mouth, and an upset stomach. Such signs usually occur in worm disease." (Male, 48 years old, Thai ethnic group).

In association with abdominal pain, many villagers talked about the feelings of nausea, and they considered it as *"the sign of a worm looking for food or for a place to mate and give eggs"* which makes human body uncomfortable or irritated.

"Abdominal pain due to worm usually causes spasm, colic and nausea. The old people used to say that when worm creeps up to the throat, it's about to give eggs." (Female, 37 years old, Muong ethnic group).

In addition, there are also many other symptoms of worm infections which are mentioned repeatedly by many people such as: dyspepsia, go to stools several times a day, lies on the stomach, etc. Some other people mentioned some symptoms such as

feelings of disturbance in the abdomen and/or some touchable lump in the abdomen at night. These symptoms are considered as signs of worm infection.

The majority of interviewees believe that people who get worm infections have pale skin and weakness because worms have got all the nutritious food for the body.

“To my observation, those who are infected with many worms must have a big belly, pale skin, yellowish (jaundiced) eyes” (Male, 42 years old, Kinh ethnic group)

“People in the country-side who get worms usually have the following three characteristics firstly in their appearance, they have pale skin, secondly they have big belly like in the case of the children, we cannot see their body except the belly; thirdly their eyes are yellowish” (Male, 34 years old, Kinh ethnic)

4.1.3 Influence of worm infections to the human health

People’s concept of health

Health is a major concern in lives of the people of investigated communities. In daily life, the human body is considered as a system which includes many organs with various functions. They are closely linked together, and at the same time the body interacts closely and harmoniously with both social and natural environments (Gammeltoft, 1996). If one of functional organs of the body has a “problem”, the other parts of the body are affected; the harmony will be replaced by the imbalance in regulating the functions of the body.

The concept of health can be understood from perspectives of strength – health, strength, power, and stability of the body. “*Strength*” is usually considered as the capacity to carry out the daily work, and to deal with bad impact from the surrounding environment. On the other hand, “*stability*” is considered as effective and sustained capacity for the functioning of physical organs in the body. The strength and stability of the body to some extent define the constitution of the body and more or less influence the internal and external factors.

The results of interviews conducted at investigated communes showed that the villagers’ concept of health is related not only to health but also to the intensity of work. Working in hard conditions is not healthy. In addition, health is also mentioned in relationship to the spiritual factor, especially for women, when the family is good, peaceful and harmonious, it means everybody is healthy.

“In general, healthy means in terms of spirit we have nothing to be concerned with” (Male, Thai group, KT)

“A healthy person must have strong physical condition. When we have strong physical health, nutrition is a top priority; people take adequate nutritional food to maintain good health” (Male, Kinh group, PL)

Skin complexion is considered by villagers to represent a person's health condition. An individual who has ruddy skin color is considered as a healthy person. A healthy person, besides the mental issues should have adequate nutritional food.

An unhealthy-looking person is usually "pale" or "yellowish" in appearance. According to the villagers, the individuals who get worm infections have "pale" or "yellowish" skin because all the nutritional food was "used up" by worms.

There were two opposite opinions when answering the question: "Is worm infection an illness or not?" Some people considered worm infection is an illness, while others are of the opinion that worm infection is not an illness. However, most of the interviewees agreed that severe worm infection is a cause of bad health.

Many people considered worm infection as a "disease" because worms cause abdominal pain, and it may at times become dangerous to human life because worms can creep into many internal organs of the human body. There were some people who considered worm infection as a "simple" issue. The majority was that worm diseases are dangerous. The most dangerous factor mentioned was the complications of worm infections such as the presence of worms in bile duct, blood loss, and malnutrition.

"I consider worm infection as a disease because it makes the body weak" (Male, 53 years old, Kinh ethnic group).

"Worm infection should be a disease because if you get severe worm infection which is not treated, you can even die" (Male, Kinh ethnic group, PL).

"Worm disease is a serious, because all the food that we eat to nourish the body is used up by the worms. When worms use up all the substance, our body gradually becomes weak and pale" (Male, Thai ethnic group, KT)

"Worm moves up and down in the intestine causing abdominal pain. When worm gets into the bile duct, it is necessary to go to hospital for treatment, otherwise death may occur". (Female, 53 years old, Kinh ethnic group)

Some people believe that mild worm infection is not a disease; it is only when there are many worms in the body which becomes a disease.

"Anybody can get worm but if there are only a few worms, it is not a disease. However, if there are many, everybody can get 5 worms on average, but in cases where they come up to eight, nine or even ten worms, and then it needs to be considered as a worm disease."

"...worm disease brings about abdominal pain through a reaction of abdomen wall which become distended and tough. This case should be considered as a disease." (FGD, group of 20-45 years old, Thai ethnic group)

"Worm infection is not a disease; it can be cured by taking medicine to remove all the worms" (Female, FGD, group of 20-45 years old, Thai ethnic group)

“Other harmful consequences of worm infections are the damages of digestive system: worm can destroy the wall of intestines, and may cause intestinal obstruction”.

Useful aspects of worm infections

One amazing finding of this study is that: intestinal worms can be helpful to the digestion of human body. A limited number of worms they can help the human body's digestive system function better, and will also help human body have hunger feelings. This concept still exists within the Thai, Muong and Kinh people groups. Not only old people but even middle aged people, both males and females were of this perception.

With the present of worms in the intestines, the digestion could be assimilated easily, otherwise there should be indigestion.

The positive impact of worm infection is assumed that when the worms move in the bowel, they help “to clear the bowel”, “to avoid constipation”. Such impact was compared by the villagers to the useful effect of earthworm in excavating the soil to facilitate the growing of plant. Such a perception made the villagers believe that there must be some worms in the body, and that there is no need to eliminate all of them.

“Never can we worm completely, as if it is impossible to clear everything in the bowel. There should be a limited number of worms in the body which can make the digestive process better” (FGD, group of 50-60 years old, Kinh ethnic group)

“After worming 100 days, worm can appear again, worms are produced by “bad air”..., only pinworms are harmful, it does not matter to get roundworms. Worms facilitate the digestion; people can get sick if there are too many worms” (Herbalist, Muong ethnic group, 71 years old, DL)

4.2 ANTHELMINTIC TREATMENT IN POPULATION

Worming is frequently associated with signs and symptoms of infection such as abdominal pain, vomiting and nausea. Investigation results show the use of anthelmintic as not the people's first choice action. They try the temporary, "prompt management" first - finding the ways to relieve pain or nausea, then to get some anthelmintics.

There are some traditional ways to relieve the abdominal pain including taking analgesics, applying balsam, using betel leaves or tips, or simply having a rest. The use of these methods derives from the belief that abdominal pain is caused by worms. It is a common thought that when worms are hungry, they will "pester" by traveling from where they reside (gut) up to stomach to seek for food, and they are afraid of bitter substances. Thus, there are two popular options for management: The first option is to take something of bitter taste,

“Worms crawl down quickly only when you take something of bitter taste. If you take bitter medicine, this may relieve the pain and make worms pester less and grow more slowly.” (a Kinh female. 54 years old.)

which makes worms crawl down or go away; and the second option is feeding worms with their favorite foods of sweet taste (sugared water, candy, bananas), they will no longer pester.

The most common medicine used for relieving abdominal pain is chloramphenicol. In the workshop, both district and provincial health officials agree that chloramphenicol is a GI tract antibiotic, not an analgesic. The habit of using chloramphenicol before taking anthelmintic is due to some drug's effect on intestinal inflammation and bleeding. Previously in Vietnam, a serious scarcity of medicine results in prescription of chloramphenicol in such cases as these and lead to wrong conceptions within the community and even among the health staff of the villages and communes. Many people stated they learned this experience from previous attacks of abdominal pain (not necessarily caused by worms), when the health staff gave them this medicine to relieve pain. Chloramphenicol is the most frequently mentioned medicine to be used for relieving abdominal pain for both adults and children. It is highly appreciated by all the ethnic groups, and by the people at the surveyed localities (from Ba Thuoc to Hau Loc).

In addition, drinking sugared water or eating sweetened foods is a traditional method to make worms stop pestering. The health staff also observed that drinking diluted soapberry extract or sugared water also relieve the pain.

Box 1

Some "temporary" methods for managing abdominal pain or nausea caused by worms "pestering"

- ∅ Taking medicine of bitter taste (chloramphenicol) to scare worms and make them crawl down;
- ∅ Chewing betel leaves with slack lime, or salt. The betel leaf is of bitter taste, so when worms eat betel leaves, they "will not like and go away", no longer "pester";
- ∅ Applying balsam to the abdomen, then taking a rest;
- ∅ Drinking a little sulfur;
- ∅ Wrapping a cockroach with a betel leaf, applying to the abdomen, resting for a while;
- ∅ Eating or drinking sweet foods favored by worms, such as, sugared water, sugarcane, bananas;
- ∅ Having rice and soup;
- ∅ Drinking diluted soapberry extract
- ∅ Sucking hot foods such as ginger;
- ∅ Treating by tip: wearing two pieces of rush to the ears whenever suffering from nausea.
- ∅ Taking seven bananas flowers, crumpling with lime and baking until the flowers turn into orange-yellow color, washing with boiled water, taking it out and making a drink.

Many people applied these methods and rested until the pain relieved then continued with their work. They come to see the health staff only in case of ineffectiveness of the methods or if the symptoms still last. Most of them believe that it is necessary to relieve the pain before taking anthelmintic drug.

"I will take the medicine of bitter taste to make worms crawl down when I have abdominal pain at home. Chloramphenicol is bitter and can relieve the pain immediately. The doctor recommends this to make worms crawl down before taking anthelmintic. If we have no longer pain after taking a bitter medicine, that means this pain is caused by worms" (Female, ML)

"Previously, when anthelmintics were not available, I used chloramphenicol. It was the only medicine I used when I was a child and it was quite effective. We take it whenever we have abdominal pain, except when we have diarrhea. For my children, the youngest child takes chloramphenicol when she has abdominal pain caused by worms. We go to see the doctor only when the pain doesn't disappear". (Female, PL, suffered from bile duct obstruction by worms)

Worms eradication

"Worms do harm to our health that is why we should eradicate them to be stronger and fatter"
(a Thai female 40 years old)

Buying the anthelmintic is the second step in managing the abdominal pain or other symptoms. Many people have used an anthelmintic in their childhood. The basic Commune Health Center has largely provided anthelmintics to people. The commonly used anthelmintic forms were during period 1985-1986 were syrup, oil, ex-USSR tablets, "5 tablets a dose" tablets, metaladon, setelagin, satonin etc... During the reforming time these forms were not available in the pharmacies or market and had been provided only by the Commune Health Center staff.

Being aware of the negative impact that worms have on a person's health they consider worming as a most effective tool to treat this infection.

The long existence of anthelmintics can explain their frequent use among the surveyed areas. Members of almost all interviewed households have bought anthelmintics for their children and for themselves. However there are still some problems remaining as mentioned below:

When do people take an anthelmintic?

The evidence of infection, which is presented by, recognized signs and symptoms, is critical factor leading of people to buy anthelmintics. Among these signs and symptoms abdominal pain seems to be the most important. "Having symptoms" is obvious evidence of being infected and can guide people to treatment.

Up to 70% of farmers are familiar with worms' infection and they are not aware of this. They don't take the preventive measures or treatment in community. People simply take some tablets bought by themselves when they have abdominal pain" (Commune Health Center personals)

"I took an anthelmintic three months ago. At that time I had nausea. I think worms caused it. I took a "five thousand dong" tablet and since then I have no other symptoms. It was the first time I had anthelmintic in my life" (a Kinh female 32 years old);

"I think I should take my child to the doctor when he has abdominal pain" (a Kinh male 46 years old.);

"I haven't taken any anthelmintic during the past seven to eight years because I don't have abdominal pain. I don't take it regularly, I only do this when I feel my abdomen getting bigger" (a Kinh male 33 years old);

"It is in my opinion that we need to be wormed every one or two years" (a Muong female 44 years old)

Not all individuals in the family are treated simultaneously. The privilege is given to those who have obvious symptoms, most of them are children. The others avoid taking medicine simply because of absence of abdominal pain.

"I don't think I am infected, but my wife and my children are. They take anthelmintic twice a year, I don't. I do not require taking the medicine if I have no pain?" (a Thai male 40 years old)

The most frequent form of self-medication is taking anthelmintic. Some people have never come to see a doctor for helminthic infection. They take an anthelmintic when they recognize some signs and symptoms of infection. People come to CHS only in the case of ineffectiveness of self-medication. In addition the diagnostic equipment at CHS is so poor that the diagnosis is almost clinical. There are some other obstacles for people to come to see a doctor. Firstly it is due to the high cost and the inconveniences at the CHS or hospital

"My wife and my children take anthelmintic but not regularly, only in case of having abdominal pain. I usually buy by myself without seeing a doctor because of financial difficulties" (a Kinh male 34 years old);

"We just buy the medicine by ourselves; we never come to see a doctor. In fact we don't have enough money for hospital expenses. For the common diseases we try self-medication. We only take a child to hospital if he or she doesn't recover" (a Kinh female 64 years old).

Secondarily, hookworm infection is considered to be more dangerous than other kinds of worms' infection, but the diagnostic tests for detecting this parasite and the treatment of disease can be performed only in hospital, in the city or district centers for prevention of malaria, parasites and insects. It is the main obstacle for people living in distant areas. One woman living in Ba Thuoc district said that she has been infected with hookworms for many years. She knows the importance of their eradication but she delays the hospitalization as long as possible.

In general earning for living is the people's top priority. The majority of people need to feed their families. Regular medical control for diseases and for helminthic infection is important but not urgent. That is why the management appears to be relatively late, when disease is clearly symptomatic, e.g. *"taking an anthelmintic when having abdominal pain"*.

This attitude proves that disease prevention is not as important as treatment and deworming is only done whenever they have abdominal pain.

The repeated and simultaneous worming for all individuals in the family is rare, especially for adults. If the symptoms lessen or disappear people will not repeat worming, they do this only when symptoms recur. Many adults have been wormed but the last worming recorded was dated more than three years ago. The reason of this is an absence of subjective symptoms.

"I have been to the health care unit once for examination. The medical staff said I was infected and prescribed medicine for me to take. Now I no longer have any symptoms and I have not repeated the worming process" (a Thai male 68 years old);

"I think I may be infected, even though I have no pain... If we suspect we have helminthic infection we should see a doctor and get the prescribed treatment only when we have abdominal pain" (a Muong female 43 years old);

"I was wormed once when I was about twenty years old, and I was seriously ill because of it yet I did not see any worms come out. Since then I never repeated the worming process. In fact I have no abdominal pain" (a Kinh female 58 years old, village cleaner);

"I have been wormed twice and I feel allot better, I no longer have pain but sometimes when I am quite hungry I have some nausea. I think I still have worms. I haven't seen the doctor again after the second worming, due to there being no pain".

On the other hand quite a number of people know they should be wormed at six month-intervals, or we should repeat worming process regularly but at intervals more than six months, even at one year to three year- intervals. Some people think worming is only necessary when "there is a lot of worms", and some others think that worming is harmful for health.

"Frequent worming is very harmful. Doing this every year or every two years is enough. Anthelmintics are toxic substances which prevent the growing" (a Kinh male 73 years old);

"I was wormed three or four years ago. Previously I had abdominal pain, I took anthelmintic because I thought it was related to helminthic infection, but in recent years I have not paid any attention to it" (a member of Village Women Association);

"My children and I, repeat the worming every two years, but recently I have been so busy and have had no opportunity to do this" (a Muong female 43 years old).

According to the collected results, people who had relatives hospitalized for worms' infection pay more attention to repeating the worming process. In case of Mrs. P who has four-year-old child hospitalized for intestinal obstruction. Consequently she repeats the worming process for her children every year regardless of abdominal pain.

How do people take the anthelmintics?

Case of Mrs. D.: Mrs. D is a mother of four children (aged of 15-13-7-5 years old). Her husband is working far from home, she is alone and does the cultivation and takes care of the children. Her children take the anthelmintic regularly. The first time all four children were wormed simultaneously and she noticed that her youngest son had more worms come out than the three others. She now repeats the worming process for this boy twice a year instead of once a year as for the three others. She has never been wormed because she is not sure of the effect of anthelmintic on adults. The way she gives anthelmintic to her children is described as below:

"I let my children have a light meal for dinner, the next morning I give them sugared water or a bananas or a candy before they take anthelmintic, and at midmorning I give them some rice gruel. I think the children should be hungry to make the worms hungry too; as a result they will take more medicine, be more intoxicated and come out. The sweet things help to attract more worms" (a Kinh female 38 years old).

People believe that there are some supportive means, which are "synergic" with anthelmintics. Taking medicine before meal while fasting, attracting worms by giving them their favorite foods (sweets, bananas, coconut jus, fried peanuts...), having liquid meals (gruel, soup...) ... are listed.

In contrast in two villages at sea side many people think that taking sweet things will help worms to develop. Some women recommend abstaining from sweets while taking anthelmintic because sweets can resuscitate worms. This opinion is quite popular among the fishing women and women sellers of traditional anthelmintics.

"The sweets can make worms come alive again. We usually take a peanut, the fried one to attract the worms" (a Kinh female 38 years old).

The time for taking anthelmintic is closely related to the weather. For having more anthelmintic effect people usually take medicine in cool period, e.g. from September each year. People don't take anthelmintic in the summer because they become tired from the heat, and it will become worse with anthelmintic. In addition the medicine can be secreted by sweat, and its blood level can be too low for intoxicating worms. The cold weather is not suitable for worming either.

"Sometimes I take the anthelmintic, in cool seasons" (a Thai male 39 years old);

"I often give anthelmintic to my child in July-August (lunar calendar) when it is cool. According to the recommendation of medical staff we should be wormed in cool season for a good result" (a Kinh male 46 years old)

"I usually give anthelmintic to my children when it is warm. It is better than in cold weather. Hot weather is not good for a child's health, and the medicine can be diluted by sweat. The drug level may be too low to intoxicate worms" (a Kinh female 42 years old)

In two sea side villages the worming depends on the moon cycle. Many women consider the beginning of lunar month as the suitable time for worming. They explain this by worms' reproduction cycle. According to the opinion of the local people the first

lunar week is best time for worming (first week is conceiving time, second week is bearing time).

"According to my grand-mother's experiences the beginning of month is the time for worms get nutrients so worming during this time is more effective. I usually give anthelmintic to my children in this period of time" (FGD 50-65 years old)

"Doctors don't recommend the best time for taking anthelmintic, but I think the beginning of month is best. Our grandparents recommend this too." (Kinh FGD, 50-65 years old)

From the people's point of view the effectiveness of an anthelmintic is assessed by the amount of worms visually observed outside after taking medicine. The effectiveness of treatment is questioned when people don't observe any worms out. Some people wonder if the medicine can lead to the worms' lysis. A good anthelmintic, according to people opinion, has to eliminate a large amount of worms. This may be up to as many as ten worms. If there is no worm, it may be due to the poor helminthic quality, or it may also be due to the absence of worms in our body. This may lead to discontinuing the regular worming.

"I get anthelmintic at health care unit but it is not effective" (a Thai male 68 years old)

"My husband takes anthelmintic very rarely, I bought for him the medicine for him twice but no worms came out after the worming process had taken place. He doesn't like to take this medicine, he says that is wasting of money" (a Kinh female 30 years old.)

"I am afraid of having too many worms too, but I have not observed any worm coming out so I don't repeat the worming process" (a Kinh female 38 years old)

Worming for adults is usually neglected. People look after children more than adults. Many adults especially men think they are not infected because of "having no pain", "feeling well", or "don't see worms out". They don't repeat worming regularly.

"I may still be infected, but I feel well. I don't stop worming definitely but prolong the intervals. My children often have abdominal pain, I think it is caused by worms so I repeat worming process for them every two years, sometimes every year" (a Thai man middle age)

"I repeat worming for my children twice a year, but I don't take anthelmintic myself because I have no symptoms. I feel well and there is no need to go and see doctor" (a Kinh female 42 years old);

"I think we are less infected when we are healthy and since we reach the age of 15-20 years old. The teenagers have to be wormed. In good health we can defend ourselves against infection and worms don't do harm when they are well nourished. We don't think that we are infected but in fact everybody should be" (a Kinh female 32 years old)

Use of anthelmintics

In the investigated areas there are various forms and prices of anthelmintics available. This medicine can be bought at the pharmacies or in the stores without prescription. There are approximately more than ten different anthelmintic products either imported or produced by central or local pharmaceutical companies. The price can vary from few thousands VND/tablet to fourteen thousands VND/tablet²⁵.

The investigators found an expired date on a sample of Mebendazole. This tablet was very popular a few years ago, but due to its toxicity it has been prohibited to use. In two seaside villages we find two stores of traditional remedies made from plants distributed in form of bolus or powder including anthelmintic bolus²⁶.

For assessing the frequency of products' use we showed a set of anthelmintic samples collected from the pharmacies and stores at investigated areas. The interviewee had to recognize the product that he or she had never used. The results of the various products were that people could recognize only a few. The most frequently used one was a monodose anthelmintic of one tablet. However the most effective anthelmintic, according to the users, was the five tablets a dose (which is not available actually). The most frequently used for children was a mountain-shape anthelmintic of sweet flavor (mixed with sticky rice powder).

The majority of people buy anthelmintic at the addresses of their choice. In some high mountainous areas the people buy it at CHS (Thai ethnic group at Ky Tan). In the lowland areas they can get it either at Commune Health Center or at pharmacies or stores (for having a credit). The only provider of health services in high mountains is commune health care center staff. In the lowland area the infrastructure is more developed and there are many retired health personals in private sector.

Psychologically people are more interested in the effectiveness of drug used than in the price. However they usually buy the locally manufactured, low or medium price (few thousands VND) anthelmintic. Few of them buy the imported product because of its high price²⁷. Ineffectiveness of some anthelmintic products may be the result of the poor quality of lower priced products.

"The quality of medicine is essential for the consumers; the price is fixed for each product"
(Kinh & Muong FGD 20-45 years old).

Very few people read the expiry date. In general most people trust in their pharmacist. The dose, the expiry date... is recommended by the sellers. There are more people living on the plains that are interested in expiry date than in the two upland villages.

²⁵ Some anthelminthics which are available at the community and collected by the research team are: 1/Mebendazol 500 mg produced by Central Pharmaceutical Company No. 5, 2/ Mebendazol produced by Nam Ha Pharmaceutical Company, 3/Zentel 200 mg imported from France; 4/ Fugacar and 5/ Zentel made by Pharmaceutical Company No. 24; 6/ Miten 400 made in India; 7/ Albendazole 400 mg produced by Ha Tay Pharmaceutical Company;

8/Hatalbena and 9/Hatamintox produced by Ha Tay Pharmaceutical Company. In addition, there are anthelminthics including 12 tablets/dosage provided by Population and Family Planning Committee to the CHS
²⁶ Herb pill is the common name of traditional medicine drugs which are prepared by grinding and mixing many herbal components into powder than make small pills to treat a certain disease

²⁷ For example, the price of one dose of imported Zentel is 14,000VND compared with one dose of domestic Zentel is 4,000VND only

"They don't show me this kind of anthelmintic; they only sell me the cheap one. Maybe they think people would not buy the high price products" (a Thai female 33 years old);

"I buy and take anthelmintic as doctor recommends"

"I simply buy anthelmintic and I don't care about anything" (Kinh FGD 20-45 years old)

Is there any difference in worming between adults and children?

Although the dose of many different kinds of anthelmintics is equal for both adults and children, people usually choose the less toxic product of sweet flavor and use lower dose for children. Children often use the mountain-shape anthelmintic or traditional bolus.

"The traditional anthelmintic bolus is more suitable for children than for adults. When my child was small this bolus worked well but it is not effective for me" (Kinh FGD 50-65 years old).

The appropriate age for worming is another concern. Some people say from the age of one year, some others say from the age of four years. In general people think the small children are not healthy enough to tolerate the toxicity of anthelmintics. We can observe the same approach to worming for ill people.

"Children from the age of one year old should be wormed. Children from three years old we should have the worming process repeated once a year, and children from five years old should have the process repeated twice a year" (a Kinh female 40 years old);

"I didn't give the anthelmintic to my child before him being four years of age because he was not healthy enough then. He is wormed from this age on" (a Kinh female 39 years old).

The majority think children should be wormed from two years of age and once a year, from five years of age at the six month-intervals. The adolescent and adults can be wormed less frequently, at one to several year-intervals, because they require less worming with their better personal hygienic measures.

"My child was pale until he was one year old, I think he needed worming but I waited until he reached the age of two" (a Kinh female 36 years old)

"I don't know why a lot of adults don't see worms come out when taking the anthelmintic" (a Kinh female 32 years old)

Can we eradicate worms by worming?

Many people (both males and females) think we cannot eradicate worms by worming even though it is effective. They search the explanations for frequent helminthic re-infection. Here are some opinions:

- The "wise" or "strong" or old worm will not take anthelmintic. That is why there are some worms left after each worming.
- People cannot explain the re-infection
- Dose of anthelmintic is just enough for killing the extra amount of worms; a small amount still exists.

"We repeat worming many times, but anyway worms re-occur";

"Worming cannot kill the strong worms but make them develop. Only the weak ones are killed and come out" (FGD 50-65 years old, PL);

"We can never eradicate worms. Not all worms are killed, some of them are too wise and they don't take anthelmintic" (a Kinh female 32 years old)

"The dose of anthelmintic is just enough to kill the mature adult worms, the larvae still exist. If we want to eradicate worms we should take the extra dose but it would be toxic for ourselves" (Thai FGD 20-45 years old).

Using the traditional remedies for worming (and for other purposes)

Many people's concepts about health problems are associated with oriental medical theory and with the principle of using traditional remedies of Chinese or Vietnamese origin²⁸. Gammeltoft (1996) noticed that the Vietnamese way of treatment is based on the combination of traditional and modern medicine.

There are quite many traditional methods of worming collected and published in the famous pharmaceutical guide "*Vietnamese medicinal plants and drugs*"²⁹.

In the investigated areas people use a combination of the traditional anthelmintic method and "western" anthelmintic drugs. The high mountain residents (mostly Thai ethnic group) use the plants in managing the common diseases such as flu, abdominal pain, diarrhea...³⁰ but almost all of them don't know about the traditional anthelmintic method. They use the "western" anthelmintics provided by CHS for worming. In one Thai village a medicine man has a prescription for worming based on traditional remedies but people don't think this prescription exists. An old man in the village said: "*Worming was not possible. If you have worms and take no anthelmintic, you will die*" (a Thai male 76 years old).

²⁸ Hoang Bao Chau, 1993

²⁹ Do Tat Loi, 2001. Vietnamese medicinal plants and drugs

³⁰ At the investigated village, a kind of leaves is widely used to boil with water for drinking to prevent diarrhea. Mostly all the households in the village use this leaves. Even, according to many people, when the rainy season starts, the source of water is not "clean" and diarrhea can occur easily, these leaves are boiled to get drinking water and taken by all family members, including children. The adults also carry this kind of water to drink when they go to the field, so that they do not drink stream water

Meanwhile the Muong and Kinh people have used some anthelmintic prescriptions, which are not popular nowadays. In two high mountain villages there are some anthelmintic prescriptions available for cows and buffaloes.

Box 2

Some anthelmintic prescriptions found in investigated areas

- ∅ Eating old coconut, both juice and flesh
- ∅ Pounding the fried pumpkin seeds and making the balls
- ∅ Making bolus from medicinal leaves
- ∅ Using a fruit named "men ket"
- ∅ Moon-shape flowers or stem of its plant
- ∅ Eating the sour bamboo well cooked with chili leaves without salt
- ∅ Eating a raw egg then applying bead-tree leaves on the abdomen (treatment of biliary duct obstruction)
- ∅ Eating a cup of uncooked rice
- ∅ Worms: cooking a kind of black saffron tuber
- ∅ Tapeworm: drinking in bed an extract of pumpkin seeds with a kind of wild leaves
- ∅ Eating "Doi" seed
- ∅ Eating bark of wild "trau" tree
- ∅ Having a lot of bitter leaves soup
- ∅ Drinking alcohol or eating hot food

Using of traditional prescriptions in the plains is more common. In two villages of Hau Loc the traditional anthelmintic bolus is found in the market. Women usually buy this medicine of sweet flavor for their children because they think it is less toxic if it is of herbal origin. Some adults used this bolus for themselves but they consider it less effective than "western" anthelmintic because of fewer amounts of worms come out.

Some people prefer using traditional prescriptions, they think using of these prescriptions is safer, but there is a need of time for preparing. Others like modern medicine because of its better effectiveness, convenience and availability, but they think it is more toxic.

"I am sure the effect of "western" anthelmintic is more rapid and its use is easier. We don't know exactly which kind of leaves to collect, and then we must prepare...I think it is better to spend 5000 or 10000VND for buying an anthelmintic" (Kinh, Muong, FGD 20-45 years old);

"I think the traditional anthelmintic prescription is better. I used "western" anthelmintic many times but I didn't see worms come out." (a Thai female 27 years old who has been wormed 7 years ago).

The using of medicine is associated with the drug's tolerance. Some people tolerate well the traditional medicine; others do well with western medicine. Drug tolerance is another factor in deciding what kind of anthelmintics must be used together with drug price and quality.

"The traditional bolus is not as effective as western anthelmintic. Some people can be wormed well by this bolus by increasing the dose; some others use western anthelmintic with good results" (a Kinh female 38 years old).

Box 3

Hereditary traditional anthelmintic at Hoa Loc market

Hoa Loc market exists with a fair on the fifth of every month. It is common market of two villages Phu Loc and Hoa Loc and is very busy. There are three drug stores in the market, where we can find several forms of anthelmintics mostly homemade. The prices vary in depend on drug's brand and seem to be reasonable. There are no imported anthelmintic products.

Mrs. L.-the owner of one store, sells the traditional bolus and powder for managing the common diseases such as caries, cough, scabies, itching... and anthelmintic. This bolus or powder is conserved in the plastic containers with a label indicating the drug composition and properties. The customers are often women. They do shopping and they buy some medicine for their children and for themselves. The prices are reasonable, depending on customers' request. Mrs. L says she inherited these prescriptions from her mother-in law. All kinds of medicine are made from medicinal plants.

Anthelmintic drug is presented in form of small bolus; the dose depends on consumer's age. A dose for adult contains 18 bolus; the price is 1500 VND/bolus.

The usage of medicine is clearly recommended as follows. When taking medicine people should have a small amount of fried peanuts, or of coconut juice or some candies or biscuits (to attract worms to medicine). After medicine had been taken it is recommended to abstain from sweet things to prevent the resuscitation of worms.

The following meal should be diluted gruel to make worms hungry and get more medicine. Worming is recommended at the beginning of month, in cool season.

Recommendations and information for health care

At the communal level, the PHC system for health care services and the net of retired health personals practicing in private sector co-exist together with medicine men and women who provide the traditional services. Local health staff is a long supporting arm for communal health care services and environmental protection program. In addition there are the pharmacists with small drugs chest at home (they can provide some consultations) or in the market.

The results of investigation showed that together with official health care staff, the pharmacists play an important role in consulting people for the usage of drug. These recommendations are indirect guidance for self-medication commonly seen in community. People trust in their advices for which drug to use.

“It is necessary to see doctor but we usually neglect this. We pass the drugstores, and see the sellers in the market and ask them for consultation when we have abdominal pain” (Kinh FGD 50-65 years old)

Mass media system (newspapers, radio, TV...), loudspeakers, meetings... are the main source for health information, but helminthic infection is still not adequately informed.

Another source for information is the social network: neighbors, relatives, and friends. The women questioned said they often share health information with their friends during working time, shopping or at the women meetings. The topic of conversation is personal health or that of their family members. They share their own experiences and recommend the reliable addresses... In many cases, despite being “unofficial”, this information source has great influence on people's decision in managing the health problems including helminthic infection. For example this is the reason why many fishing women living in Minh Duc village don't like to come to commune health center.

4.3 PRACTICE RELATED TO INTESTINAL PARASITE INFECTION

In this study, the behavior aspects relating to the risk of intestinal helminthic infections and other parasite diseases were considered within the main topics: 1/ Human and animal waste and using night-soil, manure as fertilizer; 2/ Familial hygiene and preparing food; 3/ Source of clean safe water and environmental hygiene.

4.3.1 Human body waste and the situation of using night-soil and manure as fertilizer

As explained above, helminthic infections are mainly contaminated through body waste and ingestion. The results of many studies have shown that there are strict relations between prevalence of intestinal parasite infections (roundworm, pinworm, hookworm) and using night-soil in agricultural production³¹.

Taking advantage of night-soil and animal manure as fertilizer in agricultural production has been traditionally existed for a very long time in Vietnam, especially in Northern delta provinces. When the source of chemical fertilizer was not available, together with animal muck, night-soil was considered as a value source of fertilizer particularly for vegetable and rice cultivation. There was a big need of using muck and night-soil, at some areas the collection of manure and night-soil became a job as many other traditional occupations. Even in some villages of northern delta areas, people worshiped the Emperor who worked as a manure *collector*³². Making the best use of night-soil as fertilizer, an act which has closely linked to agricultural activity and was perhaps an important factor in developing cultural behaviors and conducts of people in hygienic issues. This relates to the usage of night-soil and manure as fertilizer, designing and building the latrine in a way to collect the night-soil conveniently.

³¹ Source: MEDLINE

³² Institute of Sociology, 1998

In terms of the latrine, through observation conducted during household interviews, there were rather sharp differences in types of latrine between mountainous communes and lowland communes as well as between ethnic minority peoples and Kinh people.

Latrine:

The types of latrines observed at investigated areas are taken into consideration in the following section of this report:

4.3.1.1 Latrine met with hygienic standard

According to the district health care prevention staff, the hygienic standards of a latrine issued by the National Institute of Hygiene and Epidemiology are as follows: the facility is built with bricks, two covered compartments, roofed, regularly cleaned, and not in front of the other's house. The local people recalled that in the year of 80s, there was a campaign on building the two compartments of a latrine launched at lowland areas. Then many households built up many two compartment latrines with concrete cement or wooden cover. However, after many years of utilizing, these facilities have become degraded. There are very few families which have actually used them so far. The majority of households now have changed these two compartment latrines to one compartment latrine. In order to take night-soil easily for fertilizer purpose, the villagers have made a hole at the backward wall of the pit. According to the statistical figures issued by the Hau Loc DHC, there are 20% of households in My Loc commune utilizing hygienic latrines built by villagers themselves.

The hygienic latrine was also seen at public places such as schools, CHS, People's Committee Office. At these places, the toilet was divided into 2 parts: one toilet for urinating and one latrine for defecating. In general, the latrine was built with bricks, roofed, with door, but it was located at a place far from water source (dug well), or lack of cleaning materials such as broom, soap, water container, etc. and without the cover. Therefore, it is difficult to accept that these facilities meet the hygienic criteria. Remarkably, the primary school showed that the cleaning duty was considered as responsibility of the pupils and allocated it to each class in rotation. The majority of latrines at primary schools, day-care centers were located at a place far from the well. At some other schools where well is available but without the bucket.

4.3.1.2 Temporary latrine (built with brick or with bamboo material, etc.)

This type of latrines was rather popular in the past. Many latrine were built with brick but had bamboo roofing, many households set up the latrine temporarily by using palm-tree leaves, or bamboo screen, without any door (many latrines were covered only by a piece of plastic sheet or mat for privacy rather than hygienic purposes), most of the latrines have no cover. The main cleaning way is to scatter ashes and sweep by bamboo broom.

At the villages of Thai people (Ky Tan Commune), each household has a private place for latrine. However, it is only a pit 80-100 cm in depth and 100 cm in width which is surrounded by palm tree leaves, or it is simply a bamboo bar which is put transversely



A type of temporary latrine built with dried palm & banana leaves

on a ditch or under the shadow of a tree in a secret place. When the pit is full, the villagers will fill up and dig a new pit in another place. Toilet paper or newspaper are rarely used, mainly tree leaves or small stick are used for toilet purpose. Mostly none of households have latrines. The pits are usually dug in the corner of the garden, about 20-30m from the house. There are also many households which have no pits and defecate in a very casual way, in the garden or behind the house.

on the hillside and the pits are dug at the top of the hill. When it rains, the water runs down from top of the hill and is carried down with all the dirty material from the pit which makes the water source polluted (well and stream are the place where the villagers take water for daily life needs).

Another problem is the location of the pits, many houses are built

4.3.1.3 *Open-cast cesspool*

At Minh Loc coastal commune, Hau Loc District, it is custom to use open-cast cesspool. Each family have one open-cast pit (which is usually built with brick or cement) located at the corner of the garden without a cover. These open-cast pits are used as the container of the feces waste. The night-soil contained in these pits is to be taken out for fertilizer purposes depending on the household need, on average every 10 to 20 days, or longer. Only households which plant green vegetable utilize this type of cesspool. The villagers named this cesspool as “soaking tank”. Currently, there are only few cesspool existing in the community. However, the number of households in Minh Duc village using this type of latrine is rather high. The concern is most of these latrines do not have any covers, therefore, it would be a very favorable



condition for the flies to develop and increase the high risk of spreading intestinal parasite infections. Besides, many households set up these “soaking tanks” far from their house but very close to the road. The local authority has launched some campaigns to educate the villager to eliminate these “soaking tank” latrines and even

destroy them, but the villagers still maintain them. According to some people, this area is a sandy land, therefore if green vegetable is planted; night-soil should be used to get more productivity.

4.3.1.4 Households without latrine

The majority of fishery households in Minh Loc commune do not have latrine. Living mainly as fishermen, the local people do not need to use night-soil as fertilizer for cultivation purpose, therefore many families do not have latrine. Their habits are going to stools at sea or in the field. In general, human feces is not processed but left behind on the ground or in the sea. Through interviews with the local people two reasons for this habit were brought up they cannot afford to build the latrine because they do not have money nor land, another reason is it is more convenient and “clean” (because the sea waves will carry the waste away).

“My family do not have latrine, we defecate at sea once daily or every two days. We do not have a latrine because we are afraid of unhygienic conditions and my family does not use night-soil as fertilizer, chemical fertilizer can be used as needed. (Female, 75 years old, Kinh ethnic group).

However, there should be further study in this issue. The local key informants told the research team members that the women have a habit of going to stool together in a group. This issue should be more investigated. That habit could be a kind of social communication which is necessary with some groups’ especially female villagers. Another study showed that this kind of communication does exist in local female villagers. The women take advantages of this opportunity to exchange information, discuss family, child issues. This study found out that this form of social communication activity is very essential to the women in the village and that was the main reason why the project for developing and building hygienic latrine at this locality failed.

Waste, manure, night-soil processing

At four investigated communes, the waste processing and using of human body waste was an emerging and concerned issue. There were differences in geographic and productive conditions between four localities, the Ky Tan commune is a mountainous commune belonged to Ba Thuoc mountainous district, with large land area, the main occupation is cultivating water paddy rice and upland rice but the villagers do not have custom using night-soil. On the contrary, in Dien Lu commune (Ba Thuoc District) and Phu Loc commune (Hau Loc District), local people grow green vegetables and maximize the use of night-soil and manure as fertilizer.

“When did people start using night-soil? It is recognizable that using night-soil makes vegetable growing better. Such practice has been conducted traditionally “(Female, 53 years old, Kinh ethnic group)

“Night-soil or manure is composted for about half a month or one month. We mix up the manure with bamboo, palm leaves, and then covered with bricks to protect from chickens or rain water. The night-soil is composted for about 10 days, sometimes only 5 days if in need badly”

Animal manures such as pig, buffalo, and cow feces are usually composted before use. Villagers use straw ashes, herbs to mix up the compost within one or three months, sometimes shorter (only a few weeks) then scatter it in the field. The urine is kept in a container then used to water the vegetables.

“How do we use manure? We put it in the pit to compost for several days, or a week with straw ashes and powdered lime, then use as fertilizer” (Male, 38 years old, Thai ethnic group)

“Regarding manure, because we are agricultural cultivator therefore all types of manure from animal manure to night-soil is used in maximum to fertilize the field.... The processing issue is not safe at all. Some households use powdered lime to sterilize but many households do not use it. Some pits are built carefully, many others are set up temporarily in a very casual way, even some households set it up at the road” (Commune official).

The utilization of night-soil and manure as fertilizer is very popular. However, night-soil is mainly processed (composted) before use, except in some places where fresh night-soil is used. The need of manure is high in demand, sometimes the villagers have to buy additional manure from other places. According to the villagers, they usually buy manure from other coastal communes (Ngu Loc area). The head of CHS states that there are about 60-70% of households in Phu Loc commune which look for fresh night-soil from other areas to use for fertilizing purpose.

The duration of composting night-soil is varied and depended upon the required need. In general, if at the beginning of the crop period, the demand for fertilizer is high, the fresh night-soil or newly composted fertilizer can be used.

“When we have enough time, night-soil can be composted; we mix it up with straw ashes and fertilize the field right away. During the crop period, it should be used fresh, when the crop period finished, it can be composted for several weeks or a month” (Female, 42 years old, Kinh group)

The improper use of night-soil as fertilizer is considered very harmful and of a high risk factor to human health, especially those who are in contact directly with the night-soil. In line with the campaign to educate the people are the measures of local authorities, however, it seemed that the intervention of local authority have not been able to solve this urgent problem.

“This custom of using night-soil as fertilizer is a long-standing practice among the villagers already. Secondly, local people in this community consume a lot of vegetable. If we use some measures to prevent using night-soil, it would be very difficult because their economic lives is closely related to the vegetable already. Even local authority will not be able to apply such measures.” (Health care worker)

Utilizing fresh night-soil at Minh Duc village (Hau Loc District) and Dien Ly (Ba Thuoc District)

This custom has originated from the practice of growing vegetables in sandy places and it has been a longstanding issue since the years of 1960s when it was introduced by people emigrating from the northern areas. Especially in Minh Duc commune where people grow tobacco. Local people believed that the night-soil would be very useful in



Scattering night-soil in the field

fertilizing the tobacco, so that it (tobacco) has a very delicious tasty odor. Therefore the utilization of night-soil has become very common in this locality and gradually become a popular practice in agricultural cultivation. The utilization of fresh night-soil is closely related to the custom of using pits which are still very common in these households. According to many local people, it is difficult to

change this custom. In reality, the custom of using fresh night-soil as

fertilizer in some communes which grow vegetables has completely changed and they now use other types of fertilizer instead of night-soil (Institute of Sociology, 1998)

"This custom of using "soaking tank" is a longstanding one, this area is sandy land area therefore we have to do that get fertilizer to grow vegetable. We have tried several times to eliminate them, but people have once again utilized them. Some households cover them to prevent the fly contamination, but most of them do not use a cover therefore creating environmental pollution for themselves, then for the other households. If we request all households in the village to destroy these tanks, perhaps they will not do this, because if they do what can they fertilize the field with? In the sandy land, vegetables cannot grow without the night-soil." (Male, 65 years old, Kinh ethnic group)

The results of this survey showed that women are the people who mostly contacted with human body waste, night-soil, and manure because they are people who are in charge of taking care of the pig, cow cages, and manure compost. Observations conducted at the fields found that many people use their hands to scatter such fertilizers. According to the women, they usually go barefooted when they work and they carry the night-soil, manure because if they wear sandals or slippers, it would be very inconvenient³³. At Phu Loc village, there were some women who started using cloth gloves to scatter the night-soil. Most people walk barefooted when they go to work in the field, they use sandals when they return home. It is understandable because of the nature of their work in the field...

³³ The result of a survey conducted at one commune located at Northern delta area showed that the rate of hookworm infections at women who used night-soil is much higher than at women who did not use night-soil (Source: PMID:9463654-MEDLINE)

In fact, most of households were aware of the necessity of composting the night-soil and manure and mixing it up with powdered lime. However, it seemed that the duration of composting is neglected. It is recommended that manure or night-soil should be composted carefully with powdered lime, covered tightly with mud, and then should be allowed to sit for no less than six months so as to kill the worm larvae and bacteria, but many families do not follow such procedures closely enough. Many families do not compost with powdered lime, and rarely cover with mud but only put straws, herbs or a mat.

"I use night-soil to fertilize the field. I have to compost it for a long time and mix with powdered lime even lime can reduce the fertilizing reaction, but I have to do this to control the bacterial development and use it to fertilize the paddy rice only because the rice plant absorbed the fertilizing substances from the root, not the vegetable. I usually compost the night-soil for two months, the animal manure is usually composted for one month only." (Female, 54 years old, Kinh ethnic group)

There were differences in ways of utilizing night-soil and animal manure between ethnic groups. The Thai ethnic minority group, do not use night-soil for the purpose of fertilizing. Most of the opinions showed that the villagers think that night-soil is "dirty" therefore they do not use of night-soil as fertilizer. The interesting thing is that although night-soil is considered "dirty" the villagers in Hieng village, Ky Tan commune still have custom to use animal manure as fertilizer. The animal manure is put into use immediately, and is not composted as in other investigated villages and communes. The villagers perhaps think that the animal waste is not "dirty". This perception may be is related to the custom to leave the husbandry animal, cattle and poultry unbridled. Therefore, animal manure can be seen everywhere, scattering in the garden, in the courtyard, on the road, etc.

In addition, talking with women of the village revealed that the children (about under 5 years old) go to stool or urinate wherever they like, not at the designated place. They usually go to the garden or the road and even at the public place, and nobody cares about that. Such problems were very common at investigated areas and considered as "norm". In reality, such problems showed the negligence on the behalf of the children in the countryside.

"In the old days, our past generations never use latrines, when going to stool dogs would clean it out all. Anyhow, when we go to stool, we should go a little further from house. Dogs and chickens will eat it all" (Male, 78 years old, Thai ethnic group)

Most of the interviewees said that they washed their hand after going to stool and reminded their children about this. But such thing was not certain. The research team was not able to observe such practice, in both adult and children groups. Another study conducted at one northern delta province showed that 80% of peasants went to stool when they worked in the field. If the villagers and children go to stool at places far from water source it is almost impossible to wash their hands.

4.3.2 Familial hygiene and food preparation

Familial hygiene in this survey mainly includes issues on living in hygienic conditions, personal hygienic practices, food preparation and customs of eating and drinking. The situation of leaving pigs unbridled was rather common in Ky Tan commune, especially in Hieng village. There were also many households which still kept the cattle like buffaloes, and cows under the floor of the house on stilts which is one of the causes of environmental pollution. In fact, the water source in Ky Tan commune is polluted with the waste materials from human body and animals.

Food

Daily food and beverage play a very important role in maintaining of good health for human beings. In order to have a good health, it is essential that in daily life people they have to eat cooked food (as opposed to raw food) and drink boiled water (as opposed to unboiled water). At investigated communes, the villagers agreed that these are important factors to ensure the good health of all. The practices of eating cooked food and drinking boiled water have been considered as essential conditions for having good health. However, hygienic living conditions, especially for the children, were also mentioned by many villagers as important factor for good health.

“Firstly, we should feed the children with cooked food and boiled water, secondly it is not advisable to feed them young fruit. After going to the latrine, we have to remind them to wash their hands, before eating they also have to wash their hands...” (Female, 60 years old, Kinh ethnic group)

Some villagers mentioned the role of safe and clean water, but when they were asked about what clean water is, they can only answer: clean water is rainy water or well water. Running tap water or filtered well water is rarely mentioned as clean water.

“If we want to have good health, we should keep the water source clean, we should protect the water resource to have good health; secondly the latrine should be built and maintained carefully and cleanly...” (Male, 28 years old, Thai ethnic group)



Preparing the meal

“In my opinions, there are many risks affecting human health. Firstly, the living conditions and daily life regime should be regular and respected. If you have any health problems, you should look for health facilities to get proper health care and treatment.” (Male, 48 years old, Thai ethnic group).

Most of the opinions say that poor economic situation make the villagers lack hygienic living conditions and increase the risk of intestinal parasite infections (for instance, due to lack of food and alimentation, therefore people have to eat whatever they get, even rotten pork, fish, dead chicken, like in Ky Tan or people do not have enough nutritious food and get malnutrition which increases worm infections...)

“General speaking, in this country side area, people like to buy the meat of a dead pig because it is cheap. People here do not care about diseases; they buy the meat, whatever, condition it may be in...” (Male, 43 years old, Kinh ethnic group)

Many people, especially young people have the habit to eat rare (half cooked) meat, raw fish, blood pudding... It is very difficult to quit such longstanding habits, even though many people are aware of high risk of intestinal parasite infections.

“The villagers have the habit of eating raw food; most young and middle aged people like to eat raw fish, blood pudding. Knowing that such a habit can get them a worm infection, it is very difficult to quit such longstanding customs, many people are fully aware of worm infection risks, but they can not resist such habit.” (Male, 43 years old, Kinh ethnic group)

“Most of villagers in this area eat raw green vegetable, then raw fish, any kind of fish like chub, dory. Eating raw fish can get intestinal parasite infections easily...” (Commune official).

The villagers considered that it is safe if cleaning the green vegetable with water two or three times, no need to soak with salt. This way is very common at households of all four investigated communes.

“In order to clean the vegetable, I usually tell the kids to clean vegetable with water several times, and then dry it in the air. That’s what I tell them to do, but how can I know what they actually do at home, we eat whatever they prepare.” (Female, 38 years old, Kinh ethnic group)

Personal hygienic practices play important roles in preventing intestinal parasite infections. In fact, there was a pretty big gap between villagers’ attitude and hygienic practice; it is more difficult for the children. There are some constraints in conducting such practices, first of all, some villagers’ habit in eating for instance Thai ethnic people have the habit to eat with hands or people are not used to wash their hands before eating or after going to the latrine...

Moreover, because of hard working conditions people have to spend most of their time to work and it is impossible for them to take care of the children’s hygienic practices in the family which lead to the situation of leaving the kids crawling, sweeping, running around on the floor and eating in unhygienic or dirty conditions...

“Most of the children walk barefooted if the parents do not remind them. The children in this area are used to defecate on the ground in a very casual way, even the parents tell them not to do that, but when they are playing far from home, they still do that... then drinking unboiled water problem, yes it is. In summer time, people like drinking unboiled water because it is cool. Even

us, when we work in the field, we usually drink this kind of water because we never carry boiled water with us” (Female, 37 years old, Muong ethnic group).

In many cases, the intestinal parasite infections in children can be occurred due to the contamination with soil when they play on the ground and ingest the larvae³⁴. The followings are some observations which could result in a high risk of IP infections in the children:

Box 4

Some observation conducted at investigated localities

- J At investigated communes, there were households with different level of living conditions, there were many kinds of houses (house made of bricks, house on tilts, hatched cottage, etc.) with different types of floor such as tiled floor, cement floor, soil floor, bamboo floor, etc. During the survey, the research team observed and found out that most of floors were cleaned. But even when the floor was clean, the kids with dirty bare feet could step on the floor at any time or climbed up to the bed without washing their feet. The majority of children (from 8 to 10 years) walked barefooted and ran around on the road, in the garden.
- J The small children (about one or two years old) usually did not wear pants and crawl and creep about on the ground. The adults usually said that “let them wear no pants to get “cool”. Their hands and feet were usually dirty because playing on the ground and contaminated with soil, sand. (We have never seen a small kid with clean hands).
- J Practice of drinking unboiled water is very common. Not only children but adults also drink unboiled water (well water or even stream water). According to the villagers, they usually drink unboiled water in summer time, when it is hot, in many cases when they are working in the field, far from home.
- J Walking barefooted is very common in children. The villagers also walk barefooted when they go to the field, especially when they cultivate or fertilize at field. Most of them wear sandals when they return home or washing hands and feet after having finished their field work.
- J Most of the children can eat at any time with any kind of food and fruit. They use their dirty hand to eat when they play or crawling and creeping about.
- J Thai ethnic people’s custom to eat with hand and fingers is still very popular, especially when they eat sticky rice at wedding, death anniversary, etc. Sticky rice is put in the traditional container and villagers use hand to collect and eat rice.
- J In some areas, perhaps due to poor economic conditions, people still eat meat of sick animals, poultry (for instance Thai people still eat meat of worm infected pig, bowel of cattle contaminated with worm, dead chicken, etc.) They even know that the animal got disease, but think that it’s safe if food is well cooked.
- J Fly – the vector of transmitting disease: local people are aware of the harmful impact

³⁴ Wong, Bundy and Golden, 1991: 91

of fly but it seems that they accepted “to live together with flies”. The measures to kill fly are not effective and not coordinated. Perhaps in the villagers’ conception, it is very difficult to kill and eliminate fly in the country-side, due to “special conditions”, they can not do anything else.

J In general, the personal hygienic practices of the family members, especially children are not compatible with their awareness which is actually even very little and simple (for instance, some villagers said bowls, dishes, chopsticks, etc should be washed with hot water after meal, but in reality they wash the kitchen ware, bowl... in a very simple way with water, no soap; they wash vegetable without care with unclean water, etc.).

J Using soap to wash and clean hands is also limited (villagers use soap to clean only after using hands to scatter the compost manure/night-soil). Such problem is partly related to the villagers’ habit to save water (water after use should be used for another purposes for instance save waste water for watering the vegetable, etc).

Observing the participation of family members in keeping environmental and living hygienic conditions, the survey results showed that the women have very much participated in these activities. In addition to the field work, the women are the key persons who are responsible for housework and take care of the children.

4.3.3 Clean water sources and environmental hygiene

At four investigated communes, there are many problems in clean water sources. There are some differences in utilizing the water sources for daily life at communities, for instance in Ky Tan commune the main water sources for daily life are natural stream



Stream water - main water source for daily use

water from the mountain, in Dien Lu, Phu Loc, Minh Loc the villagers mainly use dug well water. The rate of households which can access clean water is low at investigated lowland areas. Particularly, there has been problem of contaminated water source in Dien Lu (Ba Thuoc District) and Minh Loc (Hau Loc District) – the two communes where big land area has been used for green vegetable cultivation and chemical pesticides, fertilizers

commonly used. In Minh Loc commune, there are many households which still use uncovered “soaking tank” to contain night-soil and do not have hygienic latrines.

The water sources in mountainous communes are contaminated during rainy season. According to the villagers' perception, the water sources are polluted with many toxic agents (from the leaves of the forest trees), bacteria, etc. At that time of the year, the villagers are susceptible to get intestinal diseases, diarrhea, and IP infections.

The humid weather which last several months during rainy season (March, April lunar calendar) is also favorable condition for contamination of many diseases including intestinal parasite infections. Such problem can be clearly seen at Ky Tan mountainous commune and Minh Loc coastal commune. According to the people's perception, the water from its source in the mountain is polluted with many toxic agents from the forest or contaminated with human waste contained in the "tank"; such things provide opportunities for the development of infectious diseases including IP infections.

The results of this survey also show that at the investigated communes, the actual situation of contaminated environment is due to the utilization of fresh night-soil to fertilize the vegetable cultivation by many households like in Minh Loc commune (Hau Loc District), Dien Lu commune (Ba Thuoc District) or due to the contamination of animal manure wasted from the husbandry cattle kept down underneath the houses on stilts like in Ky Tan commune. Another serious problem is the daily life waste processing issue; there is no place to control the garbage and trash in Dien Lu, Phu Loc commune, which has become a concerned issue to be solved.

There are many environmental hygiene related factors which were approached in this survey. In addition to the problem of using night-soil as fertilizer conducted by many households, the uncontrolled utilization of chemical pesticides and fertilizers is also a constraint to the improvement of living environment and community health.

"Regarding the environment, I can say that for rice farming we have to use chemical agents like herbicide, pesticide. Such substances will have negative impact on the rice, and then when we eat such rice, we must get sick. Secondly, I assume that some households still spray chemical agents on green vegetables, if we buy and eat such vegetables, it is very easy to get sick..." (Male, 53 years old, Kinh ethnic group)

Environmental hygiene and intestinal parasite infections prevention and control programs at the local communities

In order to address with the polluted environmental hygiene and sanitation issues, at the investigated communes, the mass organization and community have developed PHC and sanitation programs, but these programs are still mainly formalistic, ineffective and relied on campaign launched by health care staff. There has not been the form of money contribution in which villagers can set up a fund to pay the scavengers (garbage collectors) at communities. This is under development at many communities in northern delta areas.

The health care workers agreed that the rate of IP infections is pretty high in the communities, but IP infections prevention and control is not a real focused program. The preventive activities are mainly focused on health education to promote the good

hygienic practices such as environmental sanitation, eating cooked food and boiled water. The IEC materials on IP infections are unavailable at the four investigated communes. The health care staff are not trained and updated on IP infections prevention and control. The IP infection prevention and control program has not been developed at primary school or day care center. The teachers have not got adequate knowledge and training materials to conduct proper teaching in IP infections prevention and control. So far, there have been some sessions on personal hygiene practices such as wearing sandals, slippers to walk, washing hands, no drinking unboiled water. Observations of research team conducted during the survey showed that the teachers' intervention was not effective enough and the children also did not have enough essential conditions to follow seriously the personal hygienic rules.

In additions, regarding to the health care system, the examination and laboratory investigation to identify IP infections were not conducted at grass-root level. Such issues have limited very much the assessment of real rates of IP infections in the communities. Another problem is the anthelmintics issue. There are a great deal of types of anthelmintics circulated in the market, but lack of counseling activities to provide the people relevant information on how to use the medicines as well as specific measures to prevent and control IP infections.

Chapter 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 CONCLUSIONS

The survey was conducted at four communes belonging to Ba Thuoc and Hau Loc District, Thanh Hoa Province. It has provided a comprehensive overview on awareness as well as behaviors and practices of local people in health and IP infection management and control. Such awareness and practices in health care and IP infections control reflected the actual status of people's knowledge level and the economic development of different ethnic and geographic communities.

The perceptions in health showed that the knowledge of local people was very abundant and varied. A healthy person, as described by villagers should include physical component, working intensity, economic and especially spiritual factors. "Healthy means no worries in mind, that's all". Attention should be given to some of the opinions say that human health still depends on supernatural factors, not on human being's capacity such as labor, exercise, practices, and care of both mental and physical health.

Although the IP infection was not ranked as a high priority in the list of common diseases by the local people at four investigated communes, the majority of interviewees considered that helminthic diseases were harmful to human health. However, there were also some opinions, especially those of older aged people believing that there should be a few worms in the human body, because they (the worms) facilitate the digestion. Generally speaking, the local people did not understand adequately about the harms of IP infection and its complications such as: bile stone (biliary Lithiasis), anemia, even death....

The local people have not been able to differentiate abdominal pain because of digestive disturbances with abdominal pain due to IP infections; therefore they usually take "bitter leaves (herb)" or chloramphenicol to treat such symptoms. When worm infection was suspected, villagers purchase anthelmintics to treat themselves; very few people looked for medical care at CHS. The data collected from CHSs showed that most of the IP cases examined and treated at the CHS were the children, but the number of villagers who brought their children to CHS for health care was still very low. Most of IP cases examined at CHS were the patients who failed to treat themselves then after that went to CHS to be referred to the upper level (DHC).

Anthelmintics were used by the villagers to treat the worm infections, and the majority of people purchased the pharmaceutical drugs. Very few people used traditional vermifuges (in pills, not herb) to treat IP infections, usually for children. Nobody used

herbs (ethnic people's leaves) to worm human beings because it is very toxic and dangerous for human health.

Although being aware of certain ways of IP transmission and how to prevent it, the majority of villagers still considered that using anthelmintics are the most effective way to prevent it rather than to conduct proper hygienic practices and to change negative habits to avoid IP infections.

The drug sellers and pharmacist played a very important role in providing relevant information and counseling to the villagers when they buy vermifuges. Different types of anthelmintics are available for all villagers to buy. However, the counseling activity is very crucial by helping the clients understand the effect of each type of anthelminthic, how to use it properly. In reality, there were some people who used anthelminthic to have "worm-lysis effect" and if they (villagers) did not see any worm passed in stool, then they became doubtful and suspected the effect of such medicines. This also affected whether they took anti helminthics on a regular basis.

For the time being, there remain some customs and practices in agricultural production, utilizing food and daily life which can influence and have negative impacts on IP infection control in the communities. The most concerning problem is the utilization of fresh night-soil to fertilize the vegetable field, using unhygienic latrines, even defecating in a very casual ways to contaminate the environment or eating raw (uncooked) food with high risk of IP infections such as raw fish and raw vegetable, etc. The Thai ethnic people still have the habit to eat with fingers and hands when they go to the forest, field, and it is very easy to be contaminated with worm eggs if their hands are not washed and cleaned before eating.

Although the health care sector and other mass organizations in the communities have actively promoted and developed the environmental sanitation programs such as launching campaigns to encourage villagers to move the cattle cage from the basement of the houses on stilts (Ky Tan commune), or destroy all night-soil tank (Minh Loc commune), put all the waste and garbage in designated place (Dien Lu, Phu Loc communes), these activities have not been implemented in a coordinated way to have radical changes. The health information education and PHC communication programs have been implemented but there has not been any specific program on IP infections at investigated communities, just only at level of integrating to other programs. Therefore the effectiveness has been very limited.

5.2 RECOMMENDATIONS

Basing on the above mentioned survey results and conclusions; the research team would like to make the following recommendations:

5.2.1 Recommendations on management and health care sector issues

- ∄ In order to prevent IP infection, in line with the curative measures to treat infections such as providing anthelmintics and conducting laboratory investigations to detect the IP infections in the communities the infections control related IEC activities

should be promoted to prevent maximally the transmission of IP infections. Prevention is better than treatment.

- ∓ Developing the pilot program to set up models of hygienic sanitation facilities to expand and multiply to other areas which have similar conditions, yet ensuring that the harmony of cultural beliefs and practices at each area such as mountainous, coastal and lowland ones should be respected.
- ∓ Organizing the network of health care system at grass-root level. The health care workers should be trained and the knowledge and skills updated to provide properly the health education to the villages. There should be designated health care staff to take care and coordinate the health activities with local authorities.
- ∓ Establishing the pilot model of coordinating health care activities, upgrading the CHSs

5.2.2 Recommendations to the Provincial/District/Communal Authorities

- ∓ In order to change the people's behaviors and practices in IP infection control, there should be the coordination and involvement of local authorities from provincial to grass-root levels. Therefore in cooperation with local authorities, the mass organizations such as the Fatherland Front, WU, YU, Veterans' Association, and Farmers' Association, should be encouraged to participated in PHC and environmental protection activities to be implemented at the communities. The participants from these organizations should be trained in PHC and sanitation programs to raise community awareness in these issues.
- ∓ Conducting IEC activities to raise people's awareness of the negative consequences of violating the environmental sanitary regulations (defecating in easy-going way, not using standard hygienic latrine, etc.). Launching a campaign to encourage the people to build up hygienic latrines which are appropriate to the actual conditions of the community, in both geographic and economic aspects. In the real conditions of Ky Tan, Dien Lu, Phu Loc and Minh Loc communes, the models of one or two compartment latrine should be more relevant, and depending on the specific conditions of households, encouraging the people to build up the septic tank latrine.

5.2.3 Recommendations to the school and education sector

- ∓ The teaching materials and visual aids on IP infections prevention and control should be introduced to primary schools and kindergartens.
- ∓ The teachers of primary schools and kindergartens should be trained to get knowledge in IP infections prevention and control and integrate the topics of IP infection prevention and control into the content of the sessions on hygiene and outreach activities (extracurricular) of the pupils.

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Appendices

Check- list 1: Semi-structured interview form for women/men

- Interviewee's I.D. code:.....
- Date:.....Time:.....
- Place:.....Village:.....Commune:.....
- District:..... inProvince.....
- Researchers:.....

Objective:

To study women's/men's management of worm infection, including their own and their children's health history, the current socio-economic situation in which the problems exist, selected cultural aspects, and health services for women/men from local and district source.

Interview topics	Checklist
<p>I. Women's and men's perception about health and worm infection:</p> <ol style="list-style-type: none"> 1. How do you maintain good health? In your opinion, how is a healthy person? 2. What are hazards to your health? 3. What causes worm infection? Do you think that worm infection is a disease? Why? 4. How it affects people's body/life (how good/bad)? What symptoms does a person infected with worms often have? Do worms cause other diseases? 5. Why does a person get worm infection? What is your understanding of worm infection? What kinds of worm are people often infected with? Why? How do worms get into people's body? Where do they parasitize inside the people's body? 6. What do you do if you experience an abdominal pain? What kinds of disease that you think you may get? 7. How do you perceive an abdominal pain? 8. How do you explain these symptoms? How are symptoms such as nausea, diarrhea, heartburn, abdominal cramps, and indigestion dealt with? Do you explore the causes of these symptoms? 9. What happens when you digest? (Describe how food is digested after being swallowed). What is the traditional thinking of digestion? Of causes of digestive diseases? Of worm infection? 10. What is your own opinion about cold/hot food? How does it effect your digestion? How does it relate to digestive diseases such as diarrhea, worm infection? 11. What is your opinion about illness? What kinds of diseases have you been infected with/often infected with? (<i>The interviewee uses a tool to rank the seriousness of diseases and worm infection in relation to other diseases</i>). <u>What is "pester"-called phenomenon?</u> (A phenomenon of abnormal pain caused by worms). How do you deal with? 	
<p>II. Women's and men's treatment-seeking practices in relation to worm infection</p> <ol style="list-style-type: none"> 1. In the past: What have you done? 	

<ol style="list-style-type: none"> 2. At present: What do you do if you suspect worms are the causes? Steps: beginning, then... <ol style="list-style-type: none"> a. What are common treatments of worm infection in your community? Do you know any traditional remedies or treatment methods? What is the difference between traditional and modern methods? b. Which kind of vermifuge have you used/do you use? (See the VERMIFUGE SAMPLE BOX) c. Is the expiration date of the drug important to you? d. Is the quality? e. Is the dosage? f. Its usability for adults and/or for children? g. When should a person use/ not use vermifuge? h. Who should not use? i. Have you ever talked with your neighbors or friends about de-worming methods? When did you discuss it with them? 3. When do you decide to have worm infection examination? Where do you go? Why? 4. From whom do you seek help or guidance and support? 5. What are the differences in treatment of adults and children? 6. Which and why? <p><i>Give suggestions of common diseases such as malaria, tuberculosis, colic, stomach-ache, phrenalgia, heart attack, parasitical worm infection, diarrhea, typhoid, dysentery, pneumonia, influenza, scabies, ringworm..., and ask the interviewee to discuss and rank seriousness of these diseases</i></p> <p><i>Let the interviewee rank worm infection in relation to other diseases such as: pneumonia, measles, diarrhea, fever, cough, rickets, parasitical worm infection, malnutrition.</i></p>	
<p>III. Services and support sources</p> <ol style="list-style-type: none"> 1. Health sector (commune, district, province, private): facilities, medicines, attitude and qualification 2. Family: what kinds of support, what resources? 3. Other sources: what kinds of support and when? 	
<p>IV. Other factors influencing women's/men's health re.: worm infection</p> <ol style="list-style-type: none"> 1. Economic conditions: income 2. Culture - society: customs, social aspects, religion, eating/cooking/food hygiene practices; cattle breeding, farming and gardening of the family, the use of nigh soil (supported by observation method) 3. Working and living conditions: <ul style="list-style-type: none"> ∅ Examine the relations between worm infection and different seasons (winter/summer; dry/rainy season); ∅ the situation of eating/drinking clean water at home/while working in the field a. In your opinion, what is clean water? How dangerous is it if you use unclean water? How do you get clean water? Is it relevant to worm infection? How and why? 	

<p>b. Which water source does your family use for daily life (eating/drinking/bathing/washing)?</p> <p>c. In your opinion, what does the slogan “clean eating, clean drinking, clean habits” mean?</p> <p>d. Do you practice it?</p> <p>e. Does your family use detergent (soap, shampoo, washing-powder, washing-up liquid)? When and how?</p> <p>f. In your opinion, what are the criteria for a hygienic latrine? What is the usefulness of using it? Is it relevant to worm infection?</p> <p>g. Does your family have a latrine? Which kind? Do you keep the latrine clean?</p> <p>h. Are you in the habit of using human feces as fertilizer in farming and gardening? Why? How often do you use it?</p> <p>i. Do you compost human feces before fertilizing the field with it? (composting using additives, which? For how long? fertilizing with which farming/gardening tools)</p> <p>4. Family: child care (eating/drinking/washing and bathing, other hygienic behaviors such as: washing hands, cutting children’s finger/toe nails...); children’s play areas (observe at households or villages)</p> <p>5. Other factors: Discretely try to observe hygienic behaviors of interviewee and his/her family members if possible, for example ask to use the latrine, ask to wash hands before eating lunch</p>	
<p>V. Other information</p> <p>1. Study the differences between gender/ generation?</p> <p>2. Roles of wife/husband in health care and maintenance of a hygienic environment in the household?</p> <p>3. Who is the main person in the family responsible for taking care of children? Who is the main person in your family that makes decisions on treatment, including digestive diseases and worm infection? Why?</p> <p>4. Does anyone have knowledge about traditional remedies?</p> <p>5. Other relevant methods for de-worming?</p> <p>6. These remedies or methods were learnt from whom?</p> <p>Thank you for speaking to us, may we call again later?</p>	

Check- list 2: Semi-structured interview form for health service provider

- Interviewee’s I.D. Code:.....
- Date:.....Time:.....
- Place:.....Village:.....Commune:.....
- District:.....Thanh Hoa Province
- Researchers:.....

Objective:

To get an impression of the knowledge, attitudes, skills and practice of local health providers who are working with parasitic infections and to probe their perceptions about how they could improve their roles in fighting these infections.

Interview topic	Checklist
<p>I. Knowledge Study health provider’s perception of parasitic infections</p> <ol style="list-style-type: none"> 1. Explore health provider’s perception of parasitic infections 2. Have you had any training about worm infection? <ul style="list-style-type: none"> ∅ Where did the training take place? Who were the trainers? ∅ Do you have any comments on training contents, teaching methods? Were the timing and place appropriate? ∅ Actually, is the training useful for your work? 3. Health provider’s knowledge about: <ul style="list-style-type: none"> ∅ Transmission ∅ Infestation ∅ Diagnosing, prevention and treatment of worm infection with anthelmintics 4. Health provider’s skills <ul style="list-style-type: none"> ∅ Parasite advice ∅ Health education on worm infections, including monitoring and health education 	
<p>II. Attitude Study health provider’s motivation to do something about the problem</p> <ol style="list-style-type: none"> 1. What do you think about your tasks? 2. What do you like or dislike about your tasks? Why? <p>Your assessment on specific characteristics of worm infection in locality and people’s attitudes towards treatment of worm infection</p>	
<p>III. Practice The roles and responsibilities of health provider</p> <ol style="list-style-type: none"> 1. What are your roles and responsibilities to fight against parasite infections so far? 2. Your communication skills of health provider with people in your village/commune? 3. Experience in solving worm infection problems? <ul style="list-style-type: none"> ∅ What have you done? ∅ Which results? 	
<p>IV. Support for health provider from</p> <ol style="list-style-type: none"> 1. Organizations <ul style="list-style-type: none"> ∅ Health sector (providing technical knowledge, skills and facilities to perform your work) ∅ Community leaders (commune chairman, village-leader) 	

<ul style="list-style-type: none"> ∄ Other mass organizations 2. Community people 3. Policy 4. Family 5. Customs and environment (exploring eating/hygienic habits before eating/using fertilizer/worm disease treatment...) 6. Yourself (qualification, knowledge, skills, organization, monitoring, supervision and management of activities) ∄ Does your work relate to parasitic infections? How relevant is it? ∄ What can you do for parasitic infections? ∄ Is it necessary to modify your roles and responsibilities? ∄ What areas do you need to be trained in? ∄ What kinds of support do you need for your work? 	
<p>V. Other information</p> <ul style="list-style-type: none"> 1. Disease models in commune: common diseases, position of worm infection in the relation with these models 2. Primary Health Care programs in commune _ achievements and difficulties 3. IEC activities of worm infection performed in commune 4. Worm infection treatment models applied in commune 5. Plans/programs of worm infection prevention in commune (at present and in future) 	

Check- list 3: Semi-structured interview form for teachers

- Interviewee’s I.D. Code:
- Date:Time:
- Place:Village:Commune:
- District:.....in.....Province:
- Researchers:

Objective

Teachers give us their perception of the problems (both individual and community) with parasitic infection in the community and their roles in educating about diseases and their prevention.

Interview topic	Checklist
<p>I. Perceptions about parasitic infection</p> <p>1. Which of the highlighted problems in the above area should be paid attention to in the commune?</p> <p>2. In the view of a primary/kindergarten teacher, what are the causes of these problems?</p>	
<p>II. Teacher’s comments on parasitic infection</p> <p>1. What do people know about parasitic infection?</p> <p>2. What perceptions of parasitic infection do people have? What perceptions of worm infection do children have?</p> <p>3. What are the attitudes among people to parasitic infection? What are the attitudes among children/parents to worm infection?</p> <p>4. Your assessments of actual situation of children’s worm infection in school?</p> <p>5. What should people do to prevent parasitic infection – if anything?</p> <p>6. What should people do if they get parasitic infection? With their children?</p> <p>7. Local customs which are dangers to worm infection?</p> <p>8. Communication of people with health staff?</p> <p>9. What complaints do people make about parasitic infection?</p> <p>10. Any recommendations?</p>	
<p>III. Teacher’s comments on health activities in relation to parasitic infection</p> <p>1. Control of worm infection</p> <ul style="list-style-type: none"> ∅ Transmission ∅ Infestation ∅ Diagnosing, prevention and treatment of worm infection with anthelminthics <p>2. Health education awareness (according to programs and mass media)</p> <p>3. Training for teachers on worm infection prevention knowledge</p> <p>4. Activities of school/students related to environmental hygiene and worm infection prevention</p>	
<p>IV. Other factors related to worm infection affecting teaching and health activities</p> <p>1. Facilities/equipment?</p> <p>2. Qualification includes knowledge and practice of teachers and health workers in the fight against worm infection – assessment on explanation for</p>	

<p>lessons of worm infection and prevention? Visual teaching aids about worm infection (pictures, models...)</p> <p>3. Consultation system?</p> <p>4. Management and monitoring systems?</p>	
Constraints/recommendations:	
<p>V. Collaboration of other mass organizations (Women's Union, Youth Union, others...)</p> <p>1. Describe their support?</p> <p>2. Evaluate the support?</p> <p><i>Observe environment in schools, classes, and latrine area, clean drinking water source, both for students and teachers. Observe students during break time, if possible</i></p>	

Check- list 4: Semi-structured interview form for local key informants

- Interviewee’s I.D. Code:.....
- Date:.....Time:.....
- Place:.....Village:.....Commune:.....
- District:.....Thanh Hoa Province
- Researchers:.....

Objective

Local key persons will help us gain a better understanding of the local situation through their perceptions and experiences with parasitic infections

Interview topic	Checklist
<p>I. General views</p> <ol style="list-style-type: none"> 1. Commune leaders’ perceptions on PHCe and parasitic infection treatment? 2. Social policies related to parasitic infection? 3. Support from locality? 4. Education – Training? 5. Activities of other organizations (WU, YU...) 6. Comments on different kinds of health services? 7. Results of health workers? 8. Relations of health workers with related organizations/ community people? 	
<p>II. Services and support from</p> <ol style="list-style-type: none"> 1. Organizations: <ul style="list-style-type: none"> ∅ Health sector (commune, district, province, private): facilities, medicine, attitude, qualification ∅ Community leaders ∅ Other mass organizations 2. Community people 3. Policy 4. Family: what kinds of support and from whom? 5. Others: what kinds of support and when? 	
<p>III. Other factors affecting people’s health related to worm infection</p> <ol style="list-style-type: none"> 1. Economic situation: structures of agriculture and crop plant; habits of using fertilizer (night soil, muck...) 2. Culture – society: customs, habits, social conception, and religious belief...? 3. Working and living conditions: local geography/ climate? 4. Other factors: assessment on local people’s participation in Primary Health Care programs? 	
<p>IV. Local people’s expectations about worm infection?</p>	
<p>VI. Other information</p> <p>Commune leaders’ plans/policies of Primary Health Care programs in general and worm infection in particular (in relation to other PHC programs)</p>	

GUIDELINES FOR FOCUSED GROUP DISCUSSION

Purpose: Getting more understanding about the local people’s health perspectives, parasite infections, and practices on treatment of parasite infections through focused group discussions in the community

Topic	Content
1. Health perspectives	<ul style="list-style-type: none"> ∄ How is a healthy person in your opinion? ∄ How do you try to maintain good health? ∄ Which factors affect your health? (<i>Eating, working conditions living environment, socio-economic conditions, family health care, etc.</i>)
2. Knowledge about worm infection	<ul style="list-style-type: none"> ∄ Where are worms produced? How do worms live in the human body? What do worms like to eat? ∄ Causes of worm infection? Traditional perspectives on worm infection? ∄ Means of worm infection? (<i>The monitor facilitates the group to discuss the transmission circle of worm infection; use prepared drawings for discussion</i>) ∄ How worm infection affects a human being’s health? (<i>Very dangerous/dangerous/less dangerous/not dangerous</i>) ∄ Any positive effects of worm infection on human’s health? Give examples (<i>This information might be used for different ages of separate groups during discussing</i>) ∄ What is the relationship between nutrition and worm infection? (<i>unbalanced nutritious food/hot or cold food/children’s malnutrition</i>)
3. Attitudes and practices of worm treatment	<ul style="list-style-type: none"> ∄ When do you think you have worm infection? Symptoms of worm infection? ∄ List the names of worms you know? From where did you get this knowledge? ∄ Risks and dangers of each kind of worm? ∄ When do you think about worm treatment? <ul style="list-style-type: none"> - Steps you follow when knowing that you have worm infection? - Having no stomachache means not being infected by worms? ∄ Local practices of worm treatment <ul style="list-style-type: none"> - Health checkup? Where do you go for it? - Do you ask others about their experiences with worm treatment? If yes, what do you ask for? - What kinds of medicines do you use for de-worming? (<i>Western medicine, traditional herbs or traditional herbal pills?</i>) Where do you buy de-worming tablets? How did you use it to treat worm infection? Why? - Are you familiar with traditional remedies to treat worm infections in your community? ∄ Comparison between traditional herbs and commercial drugs to treat worm infection: Which kind do you choose? Why? ∄ Has local health staff ever given you any advice on worm treatment? Is it necessary to be counseled for worm treatment? Specific relevant advice/counseling you have tried?

<p>4. Other factors affecting worm infection</p>	<p>∅ Socio-economic factors</p> <ul style="list-style-type: none"> - Profession, crop plants and practices of using <i>powdered</i> night soil? - Working and living conditions? - Local habits and customs and eating practices <p>∅ Environmental issues</p> <ul style="list-style-type: none"> - Weather & climate during summer and rainy season? - Local people's participation in primary health care program (<i>level of support and participation</i>)
<p>5. Communication and information received about helminthic parasite diseases</p>	<p>∅ Is the PHC program implemented well in your community? Specific activities? Any activities related to the helminthic parasite infection?</p> <p>∅ Have you and how have you received information about helminthic parasite infection? Your comments about it/them?</p>
<p>6. Foresee about worm infection</p>	<p>∅ How do you foresee the situation of parasite infection in your community (the main courses)?</p>