CURRENT STATUS OF FOOD-BORNE PARASITIC ZOONOSES IN THAILAND

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INTRODUCTION

The Kingdom of Thailand, a sub-tropical country, covers an area of approximately 513,000 square kilometers in the center of Southeast Asia. The climate is warm and humid. Thailand is divided into four regions: Central, Northern, Northeastern and Southern regions. The estimated total population in 1990 was 56 million people, with approximately 23% in urban areas and 77% in rural areas. Thai is the national and official language. Approximately 95% of the people are Buddhist. Arts, literature, education and the social system are strongly influenced by Buddhist values.

CURRENT PROBLEMS AND TRENDS

Food-borne parasitic zoonoses in Thailand are of public health concern because many of them are increasingly causing death. Quite apart from human suffering, zoonotic diseases transmitted through food (Table 1) are responsible for great economic losses and hamper rural development programs. Despite fairly impressive economic development, income disparities have given rise to a deterioriation in the quality of life and increased poverty among the rural populations. Many people are now suffering from one or more parasitic infections. According to a survey by the Department of Communicable Diseases Control, the prevalence of parasitic infection rates in 1980-1981 ranged from 41% to 84%. Parasitoses included hookworm (40.56%), whipworm (6.46%), roundworm (4.04%) and taeniasis (0.78%). The most serious problem is liver fluke infection (14.72%), especially among the northeastern people where 34.6% are infected.

Factors responsible for transmission and occurrence of parasitic food-borne zoonoses can be summarized as follows:

1. The tradition of consuming raw food.
2. The habit of defecating on the ground, due to a lack of household latrines, and defecating in the field while working, which has resulted in fecal pollution of the water supply, the soil, and the vegetation.
3. The habit of going barefoot.
4. Poor personal hygiene, such as not washing hands before meals and after defecating.
5. Poverty and a lack of education about the diseases. People cannot afford to have latrines, shoes and clean water; there is limited knowledge and awareness of the diseases.
6. Inadequate water supply and lack of basic sanitation in rural communities and slum areas.
7. Inadequate food and meat inspection and law enforcement.
8. Illegal practices related to slaughtering domestic and wild animals.
9. Human migration. Infected migrants, construction workers, disaster victims, refugees in camps, hill tribe border people, and tourists carry the parasite to other areas; defecating habits may also spead the infection.
10. The human factor in the ecology : the construction of dams changes ecological and environmental conditions including animal fauna.
11. Environmental factors which enhance survival of parasites and larvae, such as a warm and humid climate.

CURRENT PREVENTION AND CONTROL MEASURES

Trichinosis, angiostrongyliasis, and capillariasis are the only food-borne zoonoses that are pre-

Table 1

Food-borne parasitic zoonoses of public health importance in Thailand, 1990

Disease	Animal sources of human infections	Animal hosts	Occurrence distribution
Trichinosis	Wild boar, hill-tribe pig, jackal, squirrel, barking deer, monitor lizard, lizard	Pig, dog, cat, wildlife	Northern provinces. Downward spread to Rayong, Kanchanaburi Prachin Buri, Chumphon
Angiostrongyliasis	Snail (*Pila* spp.) and land slug	Rat	Northeastern and Northern regions
Capillariasis	Cyprinoid freshwater fish	Unknown, birds	Samut Prakan, Saraburi, Phetchabun, Ayutthaya, Nakhon Phanom, Roi-Et, Kalasin, Surin, Si Sa Ket, Udon Thani, Nakhon Ratchasima
Opisthorchiasis	Cyprinoid freshwater fish	Dog, cat	Northeastern provinces and some northern provinces
Gnathostomiasis	Snake headed fish, catfish, eel, frog, domestic chicken and snake	Dog, cat, tiger, leopard	All regions
Taeniasis	Pig,cattle	Man	All regions, less in the southern region
Cysticercosis	(Vegetables contaminated with *Taenia* eggs)	Pig	All regions, except the southern region
Paragonimiasis	Mountainous and stream crabs, shrimps	Cat, dog, tiger, rat	Phetchabun, Saraburi, Nakhon Nayok, Nong Khai, Chiang Rai, Loei, Nan
Echinostomiasis	Fish, prawns, snail, tadpole	Dog, duck, rat	Northeastern region

sently notifiable. There are other infections which may affect public health and socio-economic development programs, such as opisthorchiasis in the Northeastern region, ancylostomiasis in the Southern region, and gnathostomiasis in all regions.

Important control measures include the following:

1. Mass treatment to decrease the prevalence.
2. Improvement of environmental sanitation:
   a. Construction of sanitary toilets and encouraging toilet usage.
   b. Ensuring an adequate supply of clean drinking water.
   c. Improvement of excreta disposal facilities, sewage treatment, and soil treatment.
3. Epidemiological assessment and surveillance.
4. Health education.
5. Integrated programs on nutrition, family planning, maternal and child health, and sanitation.

Control and prevention of these diseases are under the responsibility of the Department of Communicable Disease Control, Ministry of Public Health. The control programs have been partially integrated into basic health services and the primary health care system.

INTEGRATED PROGRAMS UNDER THE NATIONAL HEALTH DEVELOPMENT PLAN

Trichinosis: At the local level, this program includes both public health and veterinary personnel. The present control measures are outbreak investigation, treatment of human cases, and health education. Trichinoscopy is considered ineffective for the

program and should be replaced by more sensitive tests such as an immunoassay.

Taeniasis and cysticercosis: These diseases are the responsibility of the Ministry of Public Health (MoPH), Ministry of Agriculture, and Ministry of Interior. Even though meat inspection is carried out in very limited areas in some municipalities, the improvement in sanitation and hygiene measures in swine and bovine raising have had a positive impact on the prevalence of animal cysticercosis, according to the Department of Livestock Development. Control activities for opisthorchiasis by the MoPH by way of case finding and treatment with praziquantel will also impact on taeniasis.

Other sporadic diseases: These include angiostrongyliasis, capillariasis, gnathostomiasis, paragonimiasis, intestinal flukes, and other intestinal helminths. There are no control activities for animals because they carry inapparent infections. Control activities are implemented by the MoPH and mainly include treatment of human cases, outbreak investigation, and health education in outbreak areas.

SPECIAL AND JOINT CONTROL PROGRAMS

Thai-German Joint Program on Promotion of Community Health Through Parasite Control Project (TG-PHPC): The German government has signed a contract for a joint control program and contributed funds to help the Thai government cope with the high prevalence, public health and economic problems associated with opisthorchiasis. The program is now being implemented in seven northeastern provinces. It includes training executives at the provincial level, training supervisors, and training microscopists for fecal examination of parasitic infection, along with logistical support such as anthelminthic drugs, microscopes, health education materials, instruments and vehicles.

PROGRAM ACHIEVEMENTS

It has been shown that most notifiable diseases occur sporadically. The most important of these diseases is trichinosis which continues to be an important public health problem, with a morbidity rate of approximately 0.5 per 100,000 population. However, the case fatality rates have been brought down a great deal due to active case finding, health education, and early effective treatment.

Health education campaigns to educate people to prevent food-borne parasitic zoonoses is considered the most important strategy for the long term. With the present situation, however, mass treatment is urgently needed.

A control program initiated in 1984 for opisthorchiasis has succeeded in decreasing its prevalence from 1984 to 1990 in the Northeastern region (Table 2). Most of the respondents (91.53%) to a survey on the achievement of an Anti-Raw Fish Eating Campaign in 1989 among Northeastern

Table 2

Prevalence of opisthorchiasis detected at health centers in Northeastern region, 1984-1990.

Fiscal year	No. examined	Ov positive	
		No.	%
1984	39,031	30,715	78.70
1985	193,975	155,979	80.41
1986	188,535	121,649	64.52
1987	207,981	92,109	44.29
1988	450,677	160,308	35.57
1989	1,343,100	407,309	30.33
1990*	1,856,843	453,337	24.41

* Incomplete data
Source: Department of CDC, MoPH)

people noted a decline in the habit of eating raw fresh fish.

NEW ACTIVITIES BEING CARRIED OUT

Proactive control strategy:

Concepts concerning this new strengthening control strategy include the following:

The communicable disease control program has been partially integrated into provincial health services and primary health care system. Prevention and control of locally endemic diseases is one of the essential elements of primary health care. Communicable diseases, according to control and prevention measures, have been put into four main groups: (1) vaccine preventable diseases; (2) vector-borne diseases; (3) contagious diseases such as tuberculosis, leprosy, and sexually transmitted diseases; and (4) general communicable diseases including water and food-borne diseases, helminthiasis, and zoonotic diseases. Community involvement is crucially needed for control of parasitic diseases, especially for changing human habits and behavior regarding eating fish raw and personal hygiene. A joint effort between the Communicable Disease Control Regional Centers and Provincial Heath Offices has been made to identify high risk areas. Local planning and implementation of activities are through collaborative efforts of multi-purpose mobile teams, local health personnel, village health volunteers, communicators, housewives, and the village health committee.

CONCLUSION

The problem of food-borne parasitic zoonoses is a major public health concern because the diseases are not only progressive, but are disabling and deadly. Technical knowledge, including epidemiological data, surveillance systems, diagnosis, treatment and more effective control programs need to be evaluated and developed. Cooperation among the responsible authorities in the government and private sector should be strengthened further. Efforts need to be made to change human behavior, especially the habit of eating raw and inadequately cooked food.