HIV/AIDS CARE AND TREATMENT IN THREE PROVINCES IN NORTHERN THAILAND BEFORE THE NATIONAL SCALE-UP OF HIGHLY-ACTIVE ANTIRETROVIRAL THERAPY

Sombat Thanprasertsuk[1], Cheewanan Lertpiriyasuwat[1], Tasana Leusaree[2], Petchsri Sirinirund[3], Surin Sumanapan[4], Chonlisa Chariyalertsak[5], Nicole Simmons[6], Tedd V Ellerbrock[7], Taweesap Siraprapasiri[1,6], Chiraporn Yachompoo[1], Saowanee Panputtanakul[3], Pongsri Virapat[6], Panpaka Supakalin[6], Kriengkrai Srithaniviboonchai[2], Philip Mock[6], Somsak Supawitkul[6], Jordan W Tappero[6,7] and William C Levine[6,7]

[1]Bureau of AIDS, TB, and STIs, Thai Ministry of Public Health; [2]Office of Disease Prevention and Control, Region 10, Thai Ministry of Public Health; [3]Phayao Provincial Health Office, Thai Ministry of Public Health; [4]Chiang Rai Provincial Health Office, Thai Ministry of Public Health; [5]Chiang Mai Provincial Health Office, Thai Ministry of Public Health; [6]Thailand MOPH - US CDC Collaboration, Bangkok, Thailand; [7]Global AIDS Program, US Centers for Disease Control and Prevention, USA

Abstract. In 2003, Thailand launched a program to place 50,000 persons on highly active antiretroviral therapy (HAART) by the end of 2004, following a series of efforts since the early 1990s to develop comprehensive HIV/AIDS care services. To evaluate existing services and needs in advance of the national HAART scale-up, in 2002 we surveyed 31 hospitals and 389 community health centers in three northern Thai provinces, and interviewed 1,015 HIV-infected patients attending outpatient clinics. All hospitals offered voluntary HIV counseling and testing, 84% provided primary prophylaxis for *Pneumocystis carinii* pneumonia, 58% for tuberculosis, 39% for cryptococcal meningitis, and 87% had some experience providing antiretroviral therapy. Community health centers provided more limited service coverage. Of patients interviewed, 63% had been diagnosed with symptomatic HIV disease, and of these, 32% reported ever receiving antiretroviral therapy; 51% of all patients had received a CD4 T-lymphocyte count. Thailand's current national HAART scale-up is being performed in a setting of well-developed hospital-based services introduced over the course of the epidemic.

INTRODUCTION

The first case of AIDS diagnosed in Thailand was in 1984 (Weniger *et al*, 1991). By the end of 2002, it is estimated that more than 1 million Thais had been infected with HIV, 635,000 were living with HIV, and 24,000 were infected during 2002 (Thai Working Group on HIV/AIDS Projection, 2001). The increasing number of symptomatic HIV-infected persons has created an enormous burden on the health care system in Thailand, especially in the northern provinces, where an estimated 30% of all symptomatic persons in the country live (Bureau of Epidemiology, 2003).

To respond to the epidemic, the Thailand Ministry of Public Health (MOPH) has started a number of national programs. In 1992, the MOPH published the first of seven editions of the "National Guidelines for the Clinical Management of HIV Infection in Children and Adults", and began supplying cotrimoxazole for opportunistic infection prophylaxis and zidovudine free of charge to low-income, HIV-infected adults attending public clinics (Thai Ministry of Public Health, 2002). In 1995, the Ministry started providing dual antiretroviral drug therapy, using combinations of zidovudine, didanosine, and zalcitabine. In 1999, the National Prevention of Mother-to-Child Transmission Program was started to provide voluntary HIV counseling and

Correspondence: Sombat Thanprasertsuk, Bureau of AIDS, TB, and STIs, Department of Disease Control, Ministry of Public Health, Tiwanon Road, Nonthaburi 11000, Thailand.
Tel: +66(0)2590-3201; Fax: +66(0)2591-8413; mobile: +66(0)1984-6419;
E-mail: sombat@aidsthai.org

testing and zidovudine during pregnancy. As a result of this program, more than 95% of pregnant women delivering in public hospitals in Thailand receive HIV counseling and testing, prior to delivery (Amornwichet *et al*, 2002). In 2000, the National Access to Care Program was begun to pilot the provision of highly active antiretroviral therapy (HAART) as a component of comprehensive AIDS treatment and care. By June 2003, more than 8,000 patients with symptomatic HIV/AIDS or a CD4 T-lymphocyte count <200 cell/µl were receiving HAART as participants in this and other national programs.

To support this effort, the Thailand Government Pharmaceutical Organization (GPO) recently began producing a generic triple antiretroviral drug tablet, GPO-VIR, which contains nevirapine, stavudine, and lamivudine and costs about 1,200 baht (US$30)/month. GPO-VIR, which is taken twice daily, is now available to physicians and hospitals throughout the country. In April 2002, the Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM) announced that Thailand was one of 31 countries to be awarded funding for prevention and care programs in the first round of grants (The Global Fund to Fight AIDS, Tuberculosis and Malaria, 2003c). As of June 2003, the GFATM had awarded Thailand a total of US$110 million for AIDS over 5 years, which the MOPH plans to use to greatly increase the number of HIV-infected patients on HAART over the next few years (The Global Fund to Fight AIDS, Tuberculosis and Malaria, 2003a).

In the future, the MOPH plans to expand and strengthen the partnerships that are needed to obtain the political commitment and financial resources to provide comprehensive HIV care and treatment, which includes HAART, for all HIV-infected Thai citizens. In anticipation of this goal, the MOPH also plans to improve the health care service system for HIV treatment by enhancing infrastructure, training health care personnel, and monitoring the quality of clinical care and laboratory services. As these plans are implemented and antiretroviral therapy (ART) becomes available to increasing numbers of HIV-infected persons, it will be important to assure the quality, consistency, and coverage of HIV care and treatment across provinces, especially those with large numbers of symptomatic patients.

In 2001, the MOPH's Bureau of AIDS, TB, and STIs, the Office of Disease Prevention and Control in Region 10, and the Provincial Health Offices of the northern provinces of Chiang Rai, Chiang Mai, and Phayao, in collaboration with the Thailand Ministry of Public Health - US Centers for Disease Control and Prevention Collaboration and other agencies, began developing a strategy to improve HIV care and treatment for patients in Chiang Rai and Phayao Provinces and seven districts in Chiang Mai Province. The strategy is to develop and pilot test a monitoring system to evaluate and improve the HIV care and treatment services in this area and then to implement the system nationwide, after the system has been shown to be effective. An evaluation of existing HIV-related services offered at public hospitals and community health centers in the three provinces was the initial task of the project. This report contains the results of the evaluation.

MATERIALS AND METHODS

During September-November 2002, we surveyed public hospitals and community health centers and interviewed patients receiving HIV care at hospital outpatient clinics in three provinces in northern Thailand to perform the evaluation of existing HIV-related services. The purpose of the evaluation was to provide information for the MOPH and the provincial health offices in these three provinces to: (1) identify deficiencies and inconsistencies in services for HIV-infected patients, (2) highlight training needs of staff and determine unmet care, social, and informational needs of patients, and develop concepts to improve the quality, consistency, and coverage of HIV services.

Hospital survey

A survey was completed at all 31 public hospitals in Chiang Rai and Phayao Provinces and seven of the 24 districts of Chiang Mai Province. The participating hospitals included 16 community hospitals and 1 regional hospital in Chiang Rai Province, 5 community hospitals and 2 provincial hospitals in Phayao Province, and 7

community hospitals in Chiang Mai Province. The survey was designed to elicit information from hospital administrators about the number of HIV-infected patients treated, the outpatient treatment and services available for HIV-infected patients, and the systems used to manage clinical data. Also, for each province, questions about human rights protection related to HIV care were included in the survey.

A copy of the hospital survey was sent to the HIV coordinator of each hospital, who was asked to collect as much of the requested information as possible. A team of at least two health care professionals, who were unaffiliated with the hospital, subsequently visited the hospital to formally conduct the survey. Those conducting the interviews were trained to administer the survey in a standard fashion to assure validity and reliability of the information collected during the interviews. The survey data collection form was pretested at two hospitals.

Community health center survey

A second survey was completed at all 389 community health centers in all districts in Chiang Rai and Phayao Provinces and the seven districts of Chiang Mai Province. The participating health centers included 92 in Chiang Mai, 92 in Phayao, and 205 in Chiang Rai Provinces. The survey was designed to elicit information from the MOPH's freestanding primary care clinics about the number of HIV-infected patients in each clinic's catchment area, the personnel available to provide HIV care, and the treatment and services available for HIV-infected patients. Each health center is typically staffed by a nurse, a midwife, and a public health officer who can provide basic clinical preventive and treatment services.

A copy of the survey was sent to the health care official responsible for each health center, who was asked to complete the survey form and return the completed form to the provincial health office. A phone number was provided with the survey for those who had questions or encountered problems. The survey data collection form was pretested at two health centers.

Patient interview

A total of 1,027 patients receiving HIV care at outpatient clinics at the 31 participating public hospitals were interviewed for the baseline assessment. A sample of about 35 HIV-infected patients was selected at each outpatient clinic by enrolling consecutive patients attending the clinic during 3-5 clinic days. All but 2 of the hospitals interviewed 35 patients; 11 patients were interviewed at one hospital, while only 1 patient was interviewed at another hospital. These 12 patients were excluded from this analysis. Consequently, information from 1,015 patient interviews was included in this report.

Patients were screened to assure that they were 18 years of age or older, HIV-infected, and had received care at an outpatient clinic in one of the participating hospitals for at least 6 months. Those who were eligible were given an information sheet about the interview and asked to participate. After giving verbal consent, each participant was administered a questionnaire by one of the survey staff. Those who were interviewed received 100 Thai baht (about US$2.50) as compensation for their time and effort. No personal identifiers were collected or recorded. This project was approved as program evaluation through the human subjects review process at the US Centers for Disease Control and Prevention, and by the Thailand Ministry of Public Health. The interview form was pretested on 5-10 patients at two hospitals first then revised.

Statistical methods

Information from the hospital and health center surveys and the patient interviews were analyzed using EpiInfo, Version 6; SPSS for Windows, Release 11.01; and SAS, version 8.0 (SAS Foundation, Cary, NC) (Dean *et al*, 1996). Proportions were compared across groups using the chi-square test or Fisher exact test.

RESULTS

The hospital and community health center surveys and patient interviews provided information from the three provinces about HIV voluntary counseling and testing, CD4 T-lymphocyte count testing, primary prophylaxis for opportunistic infections, antiretroviral therapy, disclosure of HIV status, condom use, and human rights protection related to HIV care (Table 1).

Table 1
HIV care and treatment services received by 1,015 HIV-infected patients interviewed at outpatient clinics in 29 hospitals in northern Thailand, September - November 2002.

	No (%)	95% confidence interval
Received opportunistic infection prophylaxis		
Pneumocystis carinii pneumonia	725 (71)	69-74
Tuberculosis	371 (37)	34-40
Cryptococcal meningitis	217 (21)	19-24
Had symptomatic HIV/AIDS	625 (62)	59-65
Received antiretroviral therapy (ARV) (n=625)	202 (32)	28-36
Ever had a CD4 test	517 (51)	48-54
Patients taking ARV (n=304)	246 (81)	76-85
Patients who were not taking ARV (n=711)	271 (38)	35-42

HIV voluntary counseling and testing

All 31 hospitals offered HIV testing and pre- and post-test counseling, including 90% that offered rapid HIV testing. At the 389 community health centers, HIV pre- and post-test counseling and testing were offered in 307 (79%), 281 (72%), and 109 (28%), respectively, while 99 (25%) offered all three services. Those health centers that provided testing sent the sera to hospitals for testing. Among 862 patients, who were tested for HIV at the hospital where they were receiving care, 745 (86%) reported receiving both pre- and post-test counseling; 36 (4%) received pretest counseling only; 43 (5%), posttest counseling only; and 38 (4%), neither service.

CD4 T-lymphocyte count testing

Twenty-five (81%) hospitals offered CD4 T-lymphocyte count testing services; most of these hospitals sent specimens for CD4 T-lymphocyte counts to referral hospitals for testing. Of those interviewed, 517 (51%) reported having had a CD4 T-lymphocyte count, 451 (44%) had not been tested, and 47 (5%) could not recall being tested. Among 304 patients on ART, 246 (81%) had had a CD4 T-lymphocyte count, compared to 271 (38%) of 711 who were not on ART ($p<0.01$). Of the 451 who had not had a CD4 T-lymphocyte count, 155 (35%) did not know about the test, 127 (29%) thought they did not need the test, 122 (27%) had not had the test because of either high cost or the distance from their residence to the clinic, and 41 (9%) reported another or no reason for not being tested.

Prophylaxis for opportunistic infections

Of the 31 hospitals, 26 (84%) provided primary prophylaxis for *Pneumocystis carinii* pneumonia (PCP), 18 (58%) for tuberculosis, 12 (39%) for cryptococcal meningitis, and 7 (23%) for penicilliosis, a common opportunistic infection in northern Thailand (Sirisanthana and Supparatpinyo, 1998). Among the health centers, 84 (21%) provided primary prophylaxis for PCP, 58 (15%) for tuberculosis, and 11 (3%) for cryptococcal meningitis. Of the 233 (60%) health centers that reported having had training about opportunistic infections during the prior 2 years, 84 (36%) were providing prophylaxis for opportunistic infections, compared with 39 (25%) of 156 centers that had not had training ($p<0.05$). Among the patients interviewed, 725 (71%) reported ever receiving prophylaxis for PCP, 371 (37%) for tuberculosis, and 217 (21%) for cryptococcal meningitis.

Antiretroviral therapy

Of the 1,015 patients interviewed, 625 (62%) had been diagnosed with symptomatic HIV disease, and of these, 202 (32%) reported ever-receiving ART. Of the 423 symptomatic patients who had never received ART, 181 (43%) cited high cost as the reason for not starting therapy, 105 (25%) did not know about ART, 95 (23%) thought they were not candidates for therapy, 34 (8%) did not want to take the medications, and 5 (1%) reported another or no reason.

Disclosure of HIV status

Of those interviewed, 370 (40%) were currently married. Of those who were married, 358 (97%) reported that they had disclosed their HIV serostatus to their partner.

Condom use

Of those who were married, 342 (92%) reported being sexually active, and of these, 226 (66%) reported consistent condom use, including 7 (58%) of the 12, who had not disclosed their HIV serostatus to their partner.

Human rights protection related to HIV care

All 31 hospitals reported that they provided human rights protection related to HIV by promoting access to information on HIV care and services, voluntary HIV counseling and testing, and policies on confidentiality, non-discrimination, and equal access to limited ART.

DISCUSSION

During the next few years, the MOPH plans to expand and improve HIV care and treatment for the more 600,000 HIV-infected persons living in Thailand. This will include the provision of HAART for all 60,000 persons estimated to have symptomatic AIDS or a CD4 T-lymphocyte count <200 cells/µl. As part of this process, the Ministry is developing and pilot testing a monitoring and evaluation system of HIV-related services in three northern provinces that will provide the basis for a system that is eventually used nationwide. The evaluation of existing services was the initial task of this project. The evaluation, which included surveys of 31 hospitals and 389 community health centers and interviews of 1,015 HIV-infected patients, showed that pre- and post-test counseling, HIV testing, CD4 T-lymphocyte counts, and prophylaxis for opportunistic infections were widely available in northern Thailand.

Among the hospitals surveyed, all provided HIV pre- and post-test counseling and testing, approximately 80% provided CD4 T-lymphocyte counts, and 95% provided prophylaxis for PCP. In contrast, only about one-fourth of the community health centers surveyed offered both HIV counseling and testing, and one-fifth provided primary prophylaxis for PCP. As the number of patients on HAART increases, the role of health centers in providing HIV care should be carefully considered in view of their limited resources and capacities. Community health centers that had recent training about opportunistic infection prophylaxis had a significantly greater proportion of patients on prophylaxis than centers that had not had training. Provision of training, supplies, and clinical and laboratory support may increase the proportion of community health centers that can offer HIV testing, prophylaxis for opportunistic infections, and assistance in the clinical management of patients.

Only 37% of interviewed patients had received TB prophylaxis, although it is the most frequently observed opportunistic infection in Thailand. Some Thai hospitals and physicians are reluctant to offer isoniazid preventive therapy for TB citing prior experience with limited adherence to the 9-month prophylactic regimen, concern that low levels of adherence may promote drug resistance, and an interest in focusing resources on improving treatment of active TB cases.

More than 80% of patients on ART had had a CD4 T-lymphocyte count. However, only about half of all those interviewed reported having had a CD4 T-lymphocyte count. Of those who had not had a CD4 T-lymphocyte count, about one-third did not know about the test, approximately one-third thought they did not need the test, and the remaining one-third had not had the test because of cost or distance. According to the seventh edition of the “National Guidelines for The Clinical Management of HIV Infection in Children and Adults”, published by the MOPH in 2003, CD4 T-lymphocyte counts should be measured at the time of HIV diagnosis and then every 6 months for patients with CD4 T-lymphocyte count >350 cells/µl and every 3 months with CD4 T-lymphocyte count of 200-350 cells/µl (Centers of Disease Control and Prevention, 2002). The results of the interviews suggest that more patients might access CD4 T-lymphocyte counts if they understood the clinical importance of the test. Although patients with symptomatic AIDS are candidates for HAART even if they have not received a CD4 T-lymphocyte count, access

to this test every 6 months will increase through the national program to expand access to HAART.

About one-third of patients with symptomatic HIV disease reported receiving ART. Of symptomatic patients who had never received ART, nearly half cited high cost as the reason for not starting therapy, one-fourth did not know about ART, and about one-fourth thought they were not candidates for therapy. This information suggests that the MOPH plan to provide HAART for large numbers of patients and more emphasis on educating patients about ART might significantly increase the use of antiretroviral drugs by those who have indications for therapy.

Although all hospitals surveyed reported attention to human rights issues regarding access to care and confidentiality, a more comprehensive assessment of human rights in the context of the Thai health care system is needed. Important issues would include the extent to which economic and social support programs can be accessed by persons unwilling to publicly disclose their HIV serostatus, and the role of the health care system in responding to rights violations in the community.

Little information is available about HIV care and treatment services in resource-limited countries. Previously published reports about this topic have been limited to results of pilot studies of ART, descriptions of clinical experiences, or patients attending specialized urban HIV care services (Sirisanthana and Supparatpinyo, 1998; Farmer *et al*, 2001; Weidle *et al*, 2002; Djomand *et al*, 2003; Macharia *et al*, 2003). This report describes a regional evaluation of HIV care and treatment services in a resource-limited country. This type of evaluation may be appropriate for other resource-limited countries, especially those applying for GFATM grants or for African and Caribbean countries receiving funding from President Bush's recently announced $15 billion AIDS Plan, since documentation of improvements in HIV-related services will be useful to maintain and increase funding (The Global Fund to Fight AIDS, Tuberculosis, and Malaria, 2003b; The White House, 2003). The information for this evaluation was obtained from participating hospitals, health centers, and patients during a 3-month period by use of survey and interview forms that were only 3 to 6 pages each. The forms were completed by hospital HIV coordinators and health center staff, and 35 consecutive patients accessing HIV care were interviewed during 3-5 days at each participating hospital.

Our evaluation had several limitations. Most importantly, the patients interviewed for the evaluation may not be representative of persons living with HIV infection in northern Thailand because interviewees had to have been receiving HIV care at one of the participating hospitals for at least 6 months. Consequently, those interviewed were likely to have had more advanced disease, been more knowledgeable about HIV care, and been taking more ART than HIV-infected persons who were not receiving care. Another limitation of the evaluation is the lack of information available about the timing and frequency of CD4 counts and the effectiveness of ART, as measured by an increase in CD4 counts over time. The medical records of a sample of patients will be reviewed during the next phase of our evaluation to examine these issues.

Although HIV care and treatment are widely available in northern Thailand, these services will need to be significantly increased in the near future, as the MOPH expands access to HAART, using GFATM grants and support from the Royal Thai Government. A monitoring and evaluation system will be helpful in determining the quality and quantity of these services over time by comparing the results of future surveys with the outcomes of the baseline assessment. Although HAART is life-saving, it is complicated by problems with adherence, toxicity, and resistance (Centers of Disease Control and Prevention, 2002). Identifying and correcting problems early is as important for national HIV care and treatment programs as it is for individual patient care to achieve the remarkable clinical benefits available through HAART.

ACKNOWLEDGEMENTS

This study was supported by the US Centers for Disease Control and Prevention and the Thai Ministry of Public Health through a cooperative agreement.

REFERENCES

Amornwichet P, Teeraratkul A, Simonds RJ, *et al*. Preventing mother-to-child HIV transmission: results from the first year of Thailand's national program. *JAMA* 2002; 288: 245-8.

Bureau of Epidemiology, Department of Communicable Disease Control, Ministry of Public Health, Thailand. *Wkly Epidemiol Surveill Rep*. April 2003. [Date of Access 2003 June 12]. Available at: URL: http://www.epi.moph.go.th

Centers of Disease Control and Prevention. Guidelines for using antiretroviral agents among HIV-infected adults and adolescents: recommendations of the panel on clinical practices for treatment of HIV. *MMWR* 2002;51 (No. RR-7): 1-55.

Dean AG, Dean JA, Coulombier D, *et al.* Epi Info, Version 6: a word processing, database, and statistics program for public health on IBM-compatible microcomputers. Atlanta, GA, USA: Centers for Disease Control and Prevention, 1996.

Djomand G, Roels T, Ellerbrock T, *et al*. Virologic and immunologic outcomes and programmatic challenges in an antiretroviral treatment pilot project in Abidjan, Côte d'Ivoire. *AIDS* 2003; 17: S5-S15.

Farmer P, LÈandre F, Mukherjee JS, *et al*. Community-based approaches to HIV treatment in resource-poor settings. *Lancet* 2001; 358: 204-9.

Macharia DK, Chang LW, Lule G, *et al*. Antiretroviral therapy in the private sector of Nairobi, Kenya: a review of the experience of five physicians. *AIDS* 2003;17: 938-40.

Sirisanthana T, Supparatpinyo K. Epidemiology and management of penicilliosis in human immunodeficiency virus-infected patients. *Int J Infect Dis* 1998; 3: 48-53.

Thai Ministry of Public Health. National Guidelines for The Clinical Management of HIV Infection in Children and Adults. 7th ed. Nonthaburi, Thailand: Department of Disease Control, Ministry of Pubic Health, 2002.

Thai Working Group on HIV/AIDS Projection. Projections for HIV/AIDS in Thailand: 2000-2020. Nonthaburi, Thailand: Division of AIDS, Department of Communicable Disease Control, Ministry of Pubic Health, 2001.

The Global Fund to Fight AIDS, Tuberculosis and Malaria. Approved Funding Proposals Round 1. [Date of access 2003a June 12]. Available at URL: http://www.globalfundatm.org/proposals/round1/approved proposals.html

The Global Fund to Fight AIDS, Tuberculosis, and Malaria. Global Fund praises new funding pledges by G8, underscores need for US$ 3 billion by end of 2004. [Date of access 2003b June 10]. Available at URL: http://www.globalfundatm.org/journalists/journalists_pr.html

The Global Fund to Fight AIDS, Tuberculosis and Malaria. The Global Fund to Fight AIDS, Tuberculosis and Malaria announces first grants: commits up to $616 million over two years for prevention and treatment. [Date of access 2003c June 10]. Available at URL: http://www.global fundatm.org/journalists/journalists_pr.html

The White House. President signs HIV/AIDS Act. [Date of access 2003 June 10]. Available at URL: http://www.whitehouse. gov/news/releases/2003/05/20030527-7.html

Weidle PJ, Malamba S, Mwebaze R, *et al*. Assessment of a pilot antiretroviral drug therapy programme in Uganda: patients' response, survival, and drug resistance. *Lancet* 2002; 360: 34-40.

Weniger BG, Limpakarnjanarat K, Ungchusak K, *et al*. The epidemiology of HIV infection and AIDS in Thailand. *AIDS* 1991; 5: S71-S85.

World Health Organization. Protocol for the evaluation of HIV/AIDS care and support, 2000.