

HIV/AIDS Survival Rate among Hill Tribe Population in Northern Thailand

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ABSTRACT

Objective: To find out the current situation of HIV/AIDS, sexual behaviors, and survival times in the six main hill tribe populations in Thailand: Akha, Lahu, Karen, Hmong, Yao and Lisu, who live in northern Thailand where HIV/AIDS is of the highest prevalence in the country.

Methods: A retrospective cohort study design was conducted with a systematic data extraction of medical records of hill tribe HIV/AIDS cases from 37 hospitals in 4 provinces, northern Thailand. Statistical data were analyzed by Survival analysis and Cox's-Regression.

Results: 608 cases were recorded of which 581 were suitable for analysis. 81.0% of subjects were alive at the time of study, 39.6% were aged 26-35 years at the time of diagnosis. 64.9% were female, 36.2% were Lahu, 29.8% were Karen, 57.7% were Buddhist, and 24.6% were Christian. 57.5% were infected by sexual intercourse, 6.2% were intravenous drug users (IDU). Those receiving antiretroviral drug (ARV) had a 50% survival time of 12.4 years whereas in the non-ARV group a 50% survival time was only 5.9 years ($p \leq 0.01$). The 50% survival time of non-OI infection was 10.6 years whereas it was only 6.3 years for the OI group ($p \leq 0.01$). Cox's-regression model found that being female (HR 0.55; 95%CI 0.02-0.82), receiving ARV (HR 0.43; 95%CI 0.27-0.69), and having non-OI (HR 0.53; 95%CI 0.01-0.89) were factors favoring good survival.

Conclusion: Improving the access to health care services for hill tribe HIV/AIDS are necessary as well as encouraging them to use condoms.

Keywords: HIV/AIDS, risk factors, survival time, hazard rate, hill tribe

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HIV/AIDS is a current infectious public health problem and a main global mortality cause. Almost 30 years since the first case of HIV/AIDS was reported, WHO/UNAIDS estimated that 33.4 million people have been infected world wide, and approximately 2 million people died in 2008.¹

In Thailand, by the year 2007 approximately 610,000 cases of those living with HIV had been reported. In 2008, the Division of Epidemiology, Ministry of Public Health Thailand reported 8,331 new cases or an incidence of 13.18/100,000 population.² The cumulative HIV/AIDS cases since the first case report up to 31 December 2008 were 348,887 of whom 68.79% were male.²

The northern region of Thailand has the highest seroprevalence of HIV/AIDS.^{3,4,5} In 2008, the HIV/AIDS

prevalence was 16.50 per 100,000 population in the north, with Chiang Rai Province the highest at 21.29 per 100,000 population.⁶

In 2009 there were 600,000 people in six main hilltribe populations living in HIV/AIDS epidemic areas in northern Thailand.⁷ Nowadays, the strategies for HIV/AIDS prevention and control by the Thai government might not adequately target hill tribe population who are different in culture, belief, and life styles from the rest of the Thai people. Therefore, the objectives of this study were to investigate the current HIV/AIDS situation, sexual behaviors, and survival times among hill tribe populations in northern Thailand.

MATERIALS AND METHODS

Study design

A retrospective cohort study design was used by extraction of data from the HIV/AIDS cases medical records that include sex, marital status, date and age at diagnosis, Cluster Differential 4 (CD4) level, viral load, Opportunistic infection (OI), and the latest health status. There were 37

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hospitals from 4 provinces in northern Thailand included in the study: Chiang Rai, Chiang Mai, Phayao, and Mae Hong Son Provinces. The study sites were 37 Anti-Retro Viral Clinics (ARV) from 33 Community hospitals, 2 general hospitals, and 2 central hospitals. The period of data collection was September 2009-December 2010.

Study population

The six main hill tribe populations formed the study population in this study: Akha (Ekhaw), Lahu (Musur), Lisu (Lisaw), Karen, Kmong (Maew), and Yao.

Target population

The target population was the six main hilltribe populations who lived in the north of Thailand and who were diagnosed with HIV/ADS up to the day of data collection.

Inclusion criteria: a) found to have HIV/AIDS positive, and b) complete medical records. Cases whose tribal identity was not available were excluded from the study.

Study sample and sampling technique

Study subjects were collected by purposive sampling technique. They were HIV/AIDS positive cases who belonged to one of the six hill tribes and who attended government hospitals. All of the HIV/AIDS diagnosed cases from 37 hospitals were recruited into the study.

Research instruments

The research instruments were the completed questionnaire and medical records. The questions used in this study were developed from a literature review and related to the research conceptual framework and were tested for validity and reliability. The completed questionnaires had 4 parts: general information, risk behaviors, and history of laboratory investigation and history of medical treatment. The questions also included in the information the date of first diagnosis, last status, and latest health status in each subject. The process of data collection was blind to the subjects' names and addresses. The questions and format form had been tested by the Item Objective Congruency Index (IOC) with three external experts.

Data collection procedure

Permission was obtained from Chiang Rai Public Health Office and directors of all hospitals for access to the medical records. Research objectives had been explained to all ARV staff. The ARV clinic physicians were asked to provide clinical information for assessment of the medical information. The questionnaires were completed by a researcher. Duplication of cases at different hospitals due to error in the referral system was checked before analyzing.

Data management and data analysis

Data were double-entered and validated using Microsoft Excel. Data analysis was performed using SPSS (version 11.5; 2006 SPSS, Chicago, Illinois), Stata (version 8.2; Stata Corp, College Station, TX), and Epi-Info (version 6.04d; US Centers for Disease Control and Prevention, Atlanta, GA). The data had been kept secured with a specific password accessible only by the researcher.

Descriptive statistics. Frequency, percentage, means and standard deviation were used to explain the general characteristics of the samples.

Inferential statistics. The Kaplan-Meier survival estimation and Cox's Regression model were performed

for the survival time prediction. All statistical tests were considered significant at p -value ≤ 0.10 for univariate analysis and at $p \leq 0.05$ for multivariate analysis.

Ethical consideration

All study forms and procedures were approved by the Committee for the Protection of Human Subjects of Mae Fah Luang University, Thailand, no.REH-50032-32/2550.

RESULTS

Six hundred and eight HIV positive cases of hill tribe people were identified, but only 581 cases were suitable to be included for analysis. All patients visited ARV clinics of 37 hospitals. Ten hospitals were in Chiang Rai Province, 14 in Chiang Mai Province, 7 in Phayao Province and 6 in Mae Hong Son. Most of the subjects lived in Chiang Mai Province (46.9%), followed by Chiang Rai Province (33.1%), and Phayao Province (13.9%). The first case of HIV/AIDS in hill tribe people, a Lisu, was reported at Mae Suai Hospital, Chiang Rai Province in the year 1990. Table 1 shows that 64.9% of the subjects were male, 39.6% were between 26-35 years old at the time of diagnosis, 21.9% were 15-25 years old. 80.1% of the subjects had National Thai ID card. 36.1% of the subjects were Lahu, 29.8% Karen, 13.9% Akha, 8.1% Hmong, 6.2% Yao, and 5.9% Lisu. 80.9% were alive and 19.1% dead at the time of final status.

57.7% were Buddhist, and 24.6% were Christian. 82.6% were married and 18.8% were single at the time of diagnosis. The level of education was unrecorded in 55.8%, 28.2% were illiterate, and 14.1% had primary school education. 57.3% were agricultural workers.

Different laboratory methods for identifying HIV/AIDS status were used by different hospitals. GPA and ELISA were the main methods of test for HIV. Most of the subjects had not had their CD4 level checked (81.3%). For those who had CD4 level done 10.1% showed values ≤ 200 , and 8.6% showed ≥ 201 .

Table 2 shows the majority of HIV/AIDS risk factors among hill tribe people were sexual intercourse (57.5%) followed by IDU (6.2%). 16.0% received ARV, and 6.9% had OI infections. Twenty four cases reported sexual intercourse with commercial sex workers (CSW), 13 cases reported having been commercial sex workers. Amphetamine and marijuana were the most favorite recreational drugs among the subjects.

The majority of the OIs among the subjects were TB (66.7%), Candidiasis (23.1%), PCP (17.9%), and Cryptococcosis (2.6%) respectively.

The Kaplan-Meier survival analysis found that from 605 cases, 581 cases could enter the analysis, 470 cases of those were alive and 111 cases had died.

Fig 1 shows the estimation of the survival time by the Kaplan-Meier survival estimation model which found that the total analysis time was 1283.918 years. 50% survival time was 12.39 years, and 75% survival time was 17.62 years, and 25% survival time was 4.33 years respectively.

Fig 2 shows the hazard estimation by the Nelson-Aalen cumulative hazard estimates model which found that there was a slight increase in the hazard of death in the first 5 years, and after that the number of deaths rapidly increased. Those on ARV had a delayed death when compared with those who did not receive ARV (Fig 3). Subjects who had OI infections showed a shorter survival time than those who did not (Fig 4).

TABLE 1. General characteristic.

Characteristic	N	%
Place of resident		
Chiang Rai	196	33.7
Chiang Mai	279	48.0
Phayao	19	3.3
Mae Hong Son	81	13.9
Unknown	6	1.1
Sex		
Male	204	35.1
Female	377	64.9
Age at diagnosed (year)		
≤ 14	36	6.2
15-25	127	21.9
26-35	230	39.6
36-45	91	15.7
≥ 46	44	7.6
Unknown	53	9.1
Type of ID card		
Thai national ID card (13 digits)	465	80.0
Hilltribe card	17	2.8
Immigrant card	19	3.5
No card	45	7.7
Unknown	35	6.0
Tribe		
Akha	81	13.9
Lahu	210	36.2
Lisu	34	5.9
Kmong	47	8.1
Yao	36	6.2
Karen	173	29.8
Religion		
Buddhist	335	57.7
Christian	143	24.6
Other	41	7.1
Unknown	62	10.8
Marital status		
Single	108	18.6
Married	364	62.7
Divorced	27	4.7
Cohabiting	54	9.3
Unknown	28	4.8
Education		
Illiterate	164	28.2
Primary school	82	14.1
Secondary school	6	1.1
High school	4	0.7
Bachelor	1	0.2
Unknown	324	55.8
Occupation		
Un-employed	10	1.7
Agriculture	333	57.3
Trade	5	0.9
Worker	202	34.8
Unknown	31	5.3
Life status		
Alive	470	81.0
Dead	111	19.0

The survival analysis compared between those who received ARV and non-ARV groups found that the 50% survival time of ARV was 12.39 years and 5.99 years for non-ARV ($p \leq 0.00$), and 25% of survival time was 10.59

TABLE 2. Risk factors and medical history.

Characteristic	N	%
Risk factors		
Sexual intercourse	131	22.6
Spouse	203	34.9
IDU	14	6.2
Mother to child	35	6.0
Unknown	14	2.4
More than one cause	11	1.9
Lack of information	173	29.8
Received ARV		
Yes	93	16.0
No	40	6.9
Unknown	448	77.1
OI infection		
Yes	39	6.7
No	44	7.6
Unknown	309	53.2

years in received ARV and 2.98 years in non-received ARV ($p \leq 0.00$).

The survival time was also analyzed for those with OIs and without OIs. The 50% survival time of non-OI infection was 10.59 years, whereas it was 6.33 years for OI groups ($p \leq 0.00$).

Females had a better survival time than males, at the 50% survival time was 6.64 years in males, whereas it was 12.39 years in females ($p \leq 0.00$).

The Cox's-regression model shows that the factors related to a good survival time were female sex, receiving ARV treatment, and having no OI. Females had better survival than males with a HR (Hazard Ratio) 0.55 (95%CI 0.02-0.82). Subjects who received ARV survived longer than those who did not receive ARV with a HR 0.43 (95%CI 0.27-0.69). Subjects who did not have OI infection had better survival than those who had OI infection with a HR 0.53 (95%CI 0.01-0.89).

DISCUSSION

Annittraet et al.,⁸ found that the proportion of HIV/AIDS between genders in Chiang Rai Province, Thailand were 60:40 (male to female). This study found the gender proportion between male and female in hilltribe HIV/AIDS people was 35:65. There was a difference of the proportion between gender in hill tribe and Thai people. The result

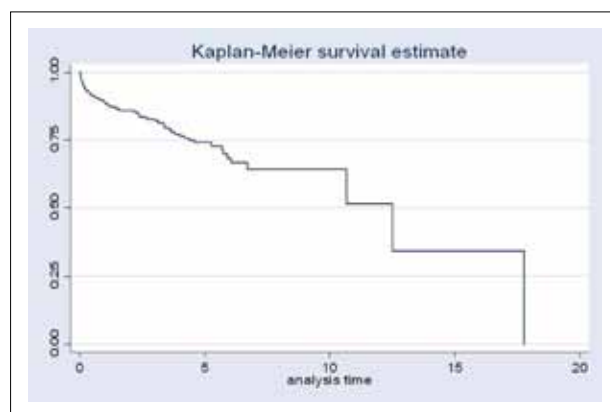


Fig 1. Estimated the survival time of the subjects by the Kaplan-Meier model.



Fig 2. Hazard estimation by the Nelson-Aalen cumulative hazard estimates model.

of this study also found the main risk factor was sexual intercourse (57.5%) similar to Annitraet et al.,⁸ who found that 94.0% was sexual intercourse.

Apidechkul et al.,⁹ found that the main risk factors were alcohol consumption, history of genital ulcer, and not married to debut partner. However, this study found that 34.9% reported that the HIV infection was contracted from their spouses. The information needed more clarification about the mechanism of infection in these groups of people especially in the specific hilltribe's cultural circumstances. In this study the factors favoring an improved survival time of HIV/AIDS patients were found to be female, receiving ARV drugs and having no-OI infection. However, Rabenecket et al.,¹⁰ found that the factors predicting outcomes in HIV/AIDS were CD4 level and type of first AIDS-defining condition. In general the CD4 level and ARV treatment coincide. In this study the incompleteness of medical records were the main problem in the step of analysis especially in the early era of the HIV/AIDS epidemic in Thailand with a variety of laboratory methods used.

Mcdavidet et al.,¹¹ found that the socioeconomic (SES) status of the subjects were related to the survival time after HIV/AIDS diagnosis. The factors that were related to the survival time were the level of their poverty and the employment status. Most of the hill tribe people in Thailand are at the low level of socioeconomic status due to lack of education, un-skilled occupation, and earning low income. These factors may influence their survival time. The result of this study coincided with the study of Hallet et al.,¹² which found that the minority people with

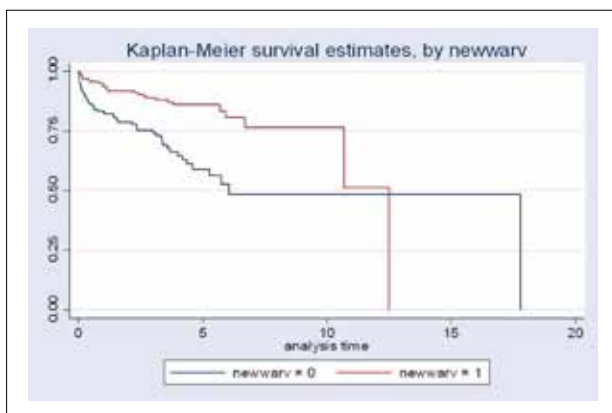


Fig 3. Hazard estimation by the Nelson-Aalen cumulative hazard estimates model among ARV group.

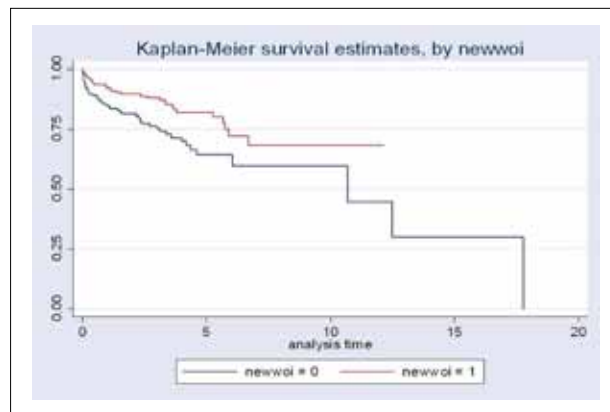


Fig 4. Hazard estimation by the Nelson-Aalen cumulative hazard estimates model among OI group.

HIV/AIDS in any country had lower survival than the native people.

Hall et al.,¹² found that the risk of death was high among injection drug users while this was found at only 6.2% among HIV/AIDS hilltribe people. Those diagnosed at older ages compared with younger persons had greater risk for death (Hall et al.,¹²), which was similar to our study which found that 15.7% were aged 36-45 years at diagnosis.

The situation of HIV-HBV and HIV-HCV co-infections in the specific population need to be addressed because the study of Pichainarong et al.,¹³ found that the seroprevalence of the HBsAg carrier among pregnant women was 8.15%, which was higher than the Thai population. The main risk factor for HBsAg carrier was the intra drug used (IDU) with OR = 5.84 (95%CI = 1.47-23.18). However, our study could not present the association between the HIV-HBV, HIV-HCV, and men who have sex with men and HIV infection because all of these kinds of information did not appear in the medical records at the time of data collection. Future studies are needed to obtain these kinds of information in order to identify risks and the effects of co-infection in this specific population.

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