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HIV-1 Prevalence, Incidence, Cohort Retention, and Host Genetics and Viral Diversity in Cohorts in East Africa and Thailand.

ECHO Study (Early Capture HIV Cohort):

Nitayaphan, S. [1], Benenson, M. [2], Sriplienchan, S.[2], Morgan, P.[2], Eamsila, C.[1], Chiu, J.[2], Thaitawat, N.[2], de Souza, M.[2], Trichavaroj, R.[2], Robb, M.[3]

[1]Royal Thai Army - Armed Forces Research Institute of Medical Sciences (AFRIMS), [2.] USA Medical Component- AFRIMS, [3.] U.S. Military HIV Research Program (MHRP)

BACKGROUND

Background:

The early stages of HIV-1 infection influence the course of the disease. Understanding the early interaction of virus and host will be important in vaccine development.

The project is designed to examine the evolution of the infecting virus(es) and the host immune responses during the very early stages of HIV infection (Fiebig stage I-II / VI).

Sites in Kenya, Tanzania, Uganda, and Thailand are participating in this multicenter study. Each site is to enroll and follow 500 volunteers as the study matures.

Background (con't)

PRIMARY OBJECTIVES

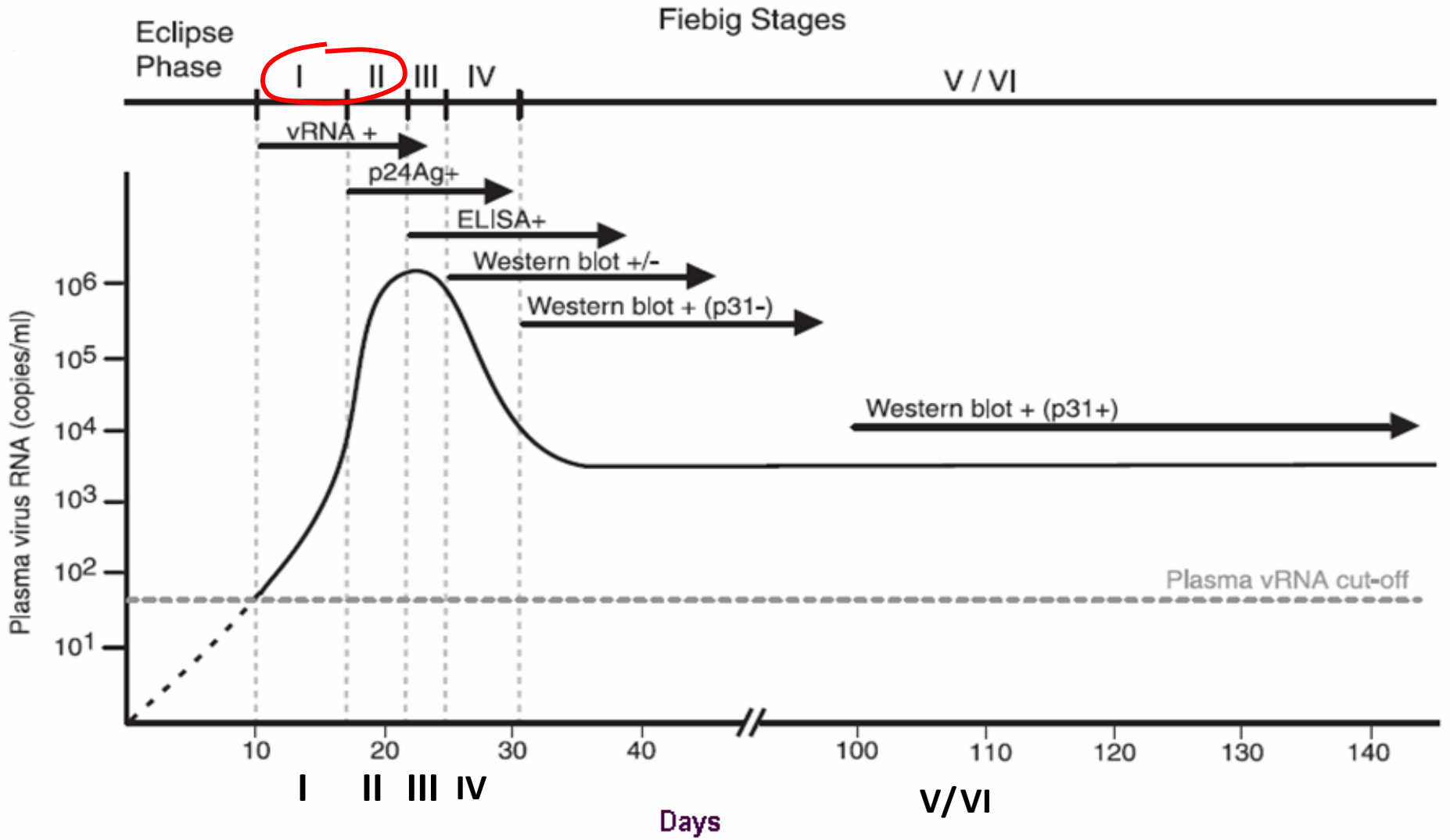
- Define the **risk behavior**, **prevalence** and **incidence** of HIV infection and **retention** of a high risk cohort of adults (in Pattaya, Thailand)

- Obtain approximately 30 acute HIV infections (AHI) with at least 30% captured within **Fiebig stages I** and **II** to support the full characterization of host responses and viral dynamics

- Observe an incidence of at least 3.7%

Background (con't)

Figure 1



Fiebig EW et al. Dynamics of HIV Viremia and Antibody Seroconversion in Plasma Donors: Implications for Diagnosis and Staging of Primary HIV Infection. AIDS 2003, 17:1871-1879

Study Population

- The study population consists of persons thought to be at higher risk for HIV infection. This includes men who have sex with men (MSM), female sex workers (FSWs), and transgenders (TGs)

- Volunteers were eligible to enroll if they met certain risk criteria within the last three months based on a risk algorithm in the ACASI questionnaire. These criteria were :
  1. sold sex,
  2. had unprotected sex with 3 or more individuals,
  3. had unprotected sex with someone they knew was HIV infected, and/or ,
  4. had signs and symptoms indicating a sexually transmitted disease.

- Various characteristics of the study populations based on the ACASI data for the first 275 volunteers are shown in Table 1

STUDY SITE

Figure 2: Study Site

The ECHO study is being conducted in Pattaya City along the eastern seaboard of Thailand.

STUDY SITE (con't)

Pattaya City and Bay
Located 1.5 hrs from Bangkok along the Eastern Seaboard

ECHO

Early **C**apture **H**IV **C**ohort

STUDY SITE (con't)

Pattaya city is a world famous tourist destination, known for its vibrant night life. It has a "flexible" population of 300,000 that expands with the tourist season.

STUDY SITE (con't)

The ECHO study collaborates with experienced NGOs in the Pattaya area, SWING (Service Workers IN Group), which works with male and female sex workers, SISTERS and HON (Health Opportunity Network) which work with transgenders.

They undertake community engagement activities, including outreach and workshops in bars, during which they talk to the potential volunteers about the study.

The first wave of volunteers was enrolled through this process, and they formed the seeds for referring members in their respective networks for screening.

Methods
&
Procedures

Study Procedures 1/2: Enrollment

- Volunteers considered at high risk for HIV infection (FSWs, MSMs, and Transgenders or TGs) and determined to be at high risk by ACASI screening are enrolling and will be followed for two years.
- At the initial visit (A), volunteers are briefed about the study, consented, take a Test of Understanding, undergo an ACASI questionnaire, receive pre-test counseling and provide a blood sample.
- The volunteers receive post-test counseling at visit B, 2-3 weeks following visit A.

Study Procedures 2/2: Study visit

1. The volunteers are seen twice a week (for at least a year) for a small blood volume collections or SBV (Figure 3) and the blood are tested by the GEN-PROBE Aptima® HIV-1 RNA Qualitative Assay

2. Volunteers are also seen every 6-months for a large blood draw to include HIV diagnostics, immunoassays, and host/viral genetics.

3. Every three months between the large blood draw visits, they will receive counseling and risk reduction education

4. Volunteers with reactive Aptima ® results are entered into an intensive one-month diagnostic verification phase to determine if the Aptima ® result represents true infection.

5. Volunteers determined to have acute HIV infection are followed for an additional five years.

ECHO Study Design

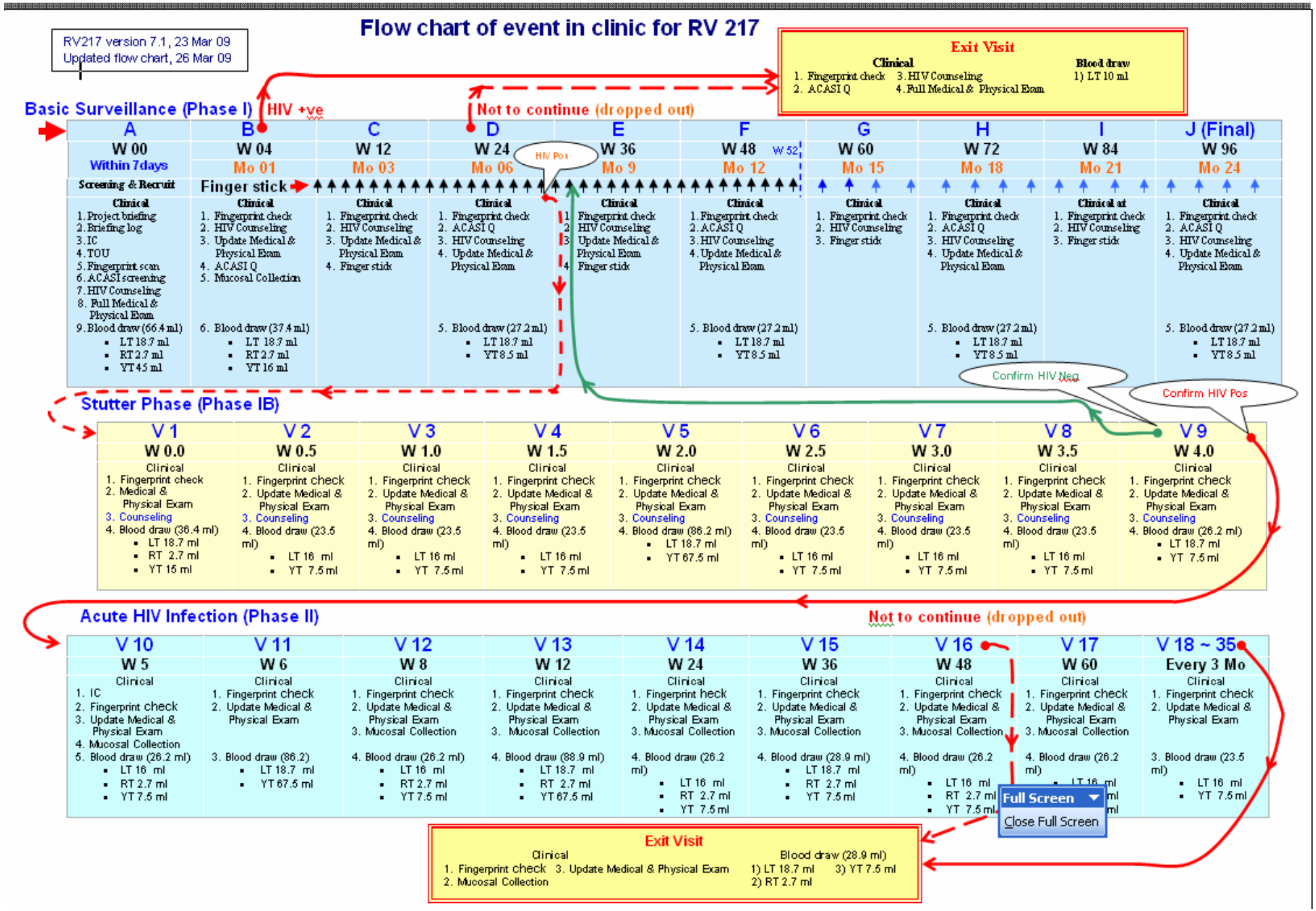


Figure 3: Small Blood Volume (SBV) collections and Aptima assay

Volunteers were seen twice a week for a small blood volume (600ul) collected by finger stick.

By the end of August 2010, more than 13,000 SBVs had been obtained and were tested using the Aptima assay.

Result to date

The first volunteers were seen in July 2009

and

from July 2009 to the end of August 2010

Table 1: Baseline - ACASI data of first 275 volunteers

* % is based on the number that responded to the question

		MSM	%*	FSWs	%*	TGs	%*
Number		86		84		105	
Average age		25.6		33.4		24.0	
Marital status	Never married	46	56%	6	8%	71	70%
	Ever married	36	44%	71	92%	30	30%
Occupation	Sex worker/entertainer	42	64%	45	67%	56	74%
	Bar/Karaoke worker	23	35%	12	18%	20	26%
	Massage worker	1	1%	10	15%	0	0%
Income /average	US$ equivalent/ month Median /range	$345 $290/ $32-$1129		$430 $322/ $0-$1129		$407 $322/$16-$1600	
Time working	Less than 2 years	56	66%	59	72%	71	70%
	2-5 years	19	22%	13	16%	21	20%
	More than 5 years	10	12%	10	12%	10	10%
Education completed	Primary (7yrs)	14	19%	22	33%	11	12%
	Pre-secondary (10 Yrs)	26	36%	22	33%	41	47%
	Secondary plus (12+)	33	45%	23	34%	36	41%
Average age at 1st Sex	Average	18.0		19.16		15.7	
	Median/ranged	18/9-28		18/ 13-41		15/5-34	

Table 2: Risk Criteria based on the ACASI baseline risk screening

	Number (%) of volunteers reporting each risk criteria			
Risk Criteria				
	MSM	**FSWs**	**TGs**	**Total**
1- Sold sex within the last three months	126 (96.2)	94 (91.3)	82 (89.1)	302 (92.6)
2- Unprotected sex with a known/suspected HIV infected partner in the last 3 months	22 (16.8)	11 (10.7)	10 (11.1)	43 (13.2)
3- Unprotected sex with 3 or more partners in the last 3 months	74 (56.5)	25 (24.3)	39 (43.3)	138 (42.3)
4- Had signs and symptoms suggesting an STI in the last 3 months	58 (44.3)	81 (78.6)	53 (57.6)	192 (58.9)
Total number of volunteers	131	103	92	326

Table 3: Number and percent of volunteers by gender with one, two, three, or four risk factors they reported

Most of each group reported at least two risk factors

Gender	One Risk Factor	Two Risk Factors	Three Risk Factors	Four Risk Factors	Total Volunteers
MSM	31 (23.7%)	60 (45.8%)	31 (23.7%)	9 (7.3%)	131
FSW	23 (22.3%)	56 (54.4%)	19 (18.4%)	5 (4.8%)	103
TGs	32 (34.8%)	37 (40.2%)	15 (16.3%)	8 (8.7%)	92

Table 4: RETENTION

by Gender

Gender	Number that were seen at Visit A	Number that successfully passed Visit A*	Number that came to Visit B (% of those successful at visit A)	Number (%) that started the small blood volume visits of those that came to Visit B	# continuing to be seen at Small Blood Volume visits (SBVs) **	Retention % of those that started SBVs that are still being followed.
MSM	138	107	95 (88.8)	92 (96.8)	81	88.0
FSWs	106	97	88 (90.7)	84 (95.4)	64	76.2
TGs	101	76	68 (89.5)	67 (98.5)	49	73.1
Total	345	280	251 (89.6)	243 (96.8)	194	79.8

Retention overall is approximately 80%, varying by gender. MSM have the best retention at 88% while TGs have the poorest at 73%

* The number that successfully passed visit A does not include those that:
- failed the ACASI (12),
- those that were identified at enrollment as prevalent cases (38),
- those that subsequently became infected (9) and,
- those that were excluded because they had medical conditions (6) .

** If a volunteer has not been seen for one month they are considered lost.

Table 5: PREVALENCE

by Gender

	Number screened (Passed visit A)	Number positive	Percent positive
MSM	131	23	17.6
FSWs	106	2	1.9
TGs	101	13	12.9
Total	345	38	11.0

The prevalence by gender is presented in Table 5. The recruitment was targeted at high risk individuals who were presumed to be HIV negative, nevertheless, the rates among MSM and TGs were similar to, and FSWs rates lower than, rates that have been found in other studies. The numbers are small and may also reflect some bias in the engagement of the FSWs.

Table 6: INCIDENCE

by Gender

Gender	Person years	Number infected	Incidence/100 PYs	95% Confidence interval Per 100 PYs
MSM	51.69	5	9.67	0.45 to 15.02
FSWs	59.82	2	3.34	-1.21 to 7.90
TGs	44.22	4	9.05	-0.63 to 14.20
Total	155.74	11	7.06	3.04 to 11.09

The incidence by gender is similar to what was observed in the prevalence. The incidence in the MSM and TGs are similar while that in the FSWs is lower. The person years of observation are still limited and the confidence limits are wide. (Table 6)

Conclusions to date:

1. Volunteers have been compliant with a very demanding twice weekly schedule of SBV collections.

2. The retention has been acceptable given the frequency of the visits and the life style of the volunteers.

3. The prevalence in the MSM and TGs is as expected. In the FSWs it is lower than expected.

4. The incidence in the MSM and TGs is high.

5. It has been possible to identify acute infections in the earliest Fiebig stages.

6. ECHO has demonstrated that efficient detection of individuals with very early acute HIV infection is feasible in Pattaya, Thailand.

Acknowledgements

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Thank you