

# FACTORS ASSOCIATED WITH NON-DISCLOSURE OF HIV INFECTION STATUS OF NEW MOTHERS IN BANGKOK

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**Abstract.** The objective of this study was to estimate HIV disclosure rates and identify factors that predict non-disclosure in Thai women who tested HIV positive during pregnancy or at delivery. This was a cohort study evaluating the implementation of prevention of mother-to-child HIV transmission programs at two Bangkok hospitals in 1999-2003. All HIV-infected women who delivered during the study period were enrollment eligible. Thai-language questionnaires were used to collect baseline data before discharge from the hospital. At the 1 and 4 month follow-up visits, women were asked if they had disclosed their HIV status. Of the 799 women who enrolled, 647 (81.0%) completed follow-up at 1 and 4 months. Four hundred fifty-three (70.0%) women disclosed their status by 1 month. Of the 194 women who had not disclosed by 1 month, 48 (24.7%) had disclosed their status by 4 months. An independent increased odds of non-disclosure by 1 month was associated with not having a partner tested for HIV (OR=5.83, 95% CI=3.19-9.08) or not knowing if the partner was ever tested for HIV (OR=13.02, 95% CI=5.26-32.28), first learning of HIV positive status during delivery (OR=6.84, 95% CI=2.36-19.81) or after delivery (OR=3.14, 95% CI=1.57-6.26) and having >2 lifetime sexual partners (OR=1.71, 95% CI=1.04-2.82). Not living with a partner every day was associated with non-disclosure by 4 months in those women who had not disclosed by 1 month (OR=2.28, 95% CI=1.43-3.64). Despite high rates of disclosure by 1 month, 22.6% of women still had not disclosed their HIV status to their partners by 4 months. The benefits of disclosure warrant effective interventions targeted at women at risk for non-disclosure.

## INTRODUCTION

Programs for the prevention of mother-to-child HIV transmission (PMTCT) are now

offering HIV testing routinely to pregnant women in many countries. Since Thailand's national PMTCT program scale-up, more than 95% of women who deliver each year in government hospitals are counseled and tested for HIV (Amornwichet *et al*, 2004). To use PMTCT services recommended in Thailand, HIV-infected pregnant women need to take antiretroviral medication themselves, give antiretroviral medication to their newborns, not

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breastfeed and receive follow-up HIV-related care for themselves and their children. Whether a woman has disclosed her HIV infection to others may influence her ability to use PMTCT services, the effectiveness of the PMTCT interventions, and whether she seeks follow-up clinical care (Farquhar *et al*, 2000; Kiarie *et al*, 2003; Kintu *et al*, 2004; Kumar *et al*, 2004; Marangwanda *et al*, 2004).

In addition to increasing the coverage of PMTCT interventions, women who disclose to their partners report more frequent condom use or abstinence (Nebie *et al*, 2001; Violari *et al*, 2004). After disclosure, partners often seek voluntary counseling and testing (Kilewo *et al*, 2001). If the partner tests negative, he can protect himself by using condoms during sex. Partners who are HIV-positive can be referred for care and treatment through the Thai Ministry of Public Health or other programs that now provide highly active antiretroviral therapy (HAART).

Although there are barriers to disclosure, disclosing one's HIV status can benefit people living with HIV infection in several ways, especially new mothers in need of support from their families. Disclosure to a partner or family member will help support planning for the child's future care. If the mother passes away or becomes ill, a partner or other family member can prepare to take care of the child. By disclosing their status, women often experience relief from no longer having to keep their HIV status a secret and they can be open to receiving support from family and friends (Bennetts *et al*, 1999; Violari *et al*, 2004). Finally, HIV-infected women often must disclose their HIV status to health and service providers to gain access to social, psychological, health, and other services that are increasingly available to people living with HIV infection.

Despite the many benefits of disclosure, HIV-infected women attending antenatal clinics often do not disclose their status (Medley *et al*, 2004). Stigma and social isolation re-

lated to HIV still exist in many communities, even in countries such as Thailand, where the HIV epidemic has been present for two decades. HIV-infected women are often discriminated against because some people associate HIV infection with behaviors known to cause infection (*eg*, commercial sex work and injecting drug use), and from an unfounded fear of HIV transmission following casual exposure to HIV-infected persons. They do not disclose their status so as to protect themselves and their children from harmful societal response. Moreover, fear of violence, abandonment or blame, along with concern about placing new burdens on loved ones, are additional barriers to disclosing one's HIV infection to family members and partners (Antelmen *et al*, 2001; Issiaka *et al*, 2001; Kilewo *et al*, 2001; Galliard *et al*, 2002; Kalyesubula *et al*, 2004; Kumar *et al*, 2004).

Since the implementation of Thailand's national PMTCT program, little is known about HIV-infected women attending antenatal clinics who choose to disclose or not their HIV status. In order to assist counselors in working effectively to help HIV-infected women make decisions regarding disclosing their HIV status, we conducted a study to better understand the rates of HIV disclosure and the factors that predict disclosure in our population of women who tested HIV positive during pregnancy or at delivery.

## MATERIALS AND METHODS

Beginning November 1, 1999, all HIV-infected women who delivered at two large Bangkok hospitals were recruited for a study to evaluate the implementation of the hospitals' PMTCT programs (Teeraratkul *et al*, 2005). All HIV-infected women who gave birth to a live child were eligible for the study except women who: 1) did not consent to enrollment, 2) could not understand the study procedures or had significant medical problems, 3) were enrolled in a contemporaneous open-label study of

zidovudine and lamivudine, or 4) were not able to follow up at the hospital after discharge.

Social work and nursing research staff collected enrollment study data using Thai-language questionnaires during the immediate postpartum period while the women were still hospitalized, generally within 3 days of delivery. Similar questionnaires were used to collect data at 1 and 4 months after delivery. At enrollment, data were collected regarding the demographic characteristics of the participants and their partners, and on pre-natal health care, HIV testing history, antenatal care (ANC) attendance, uptake of PMTCT interventions, knowledge of HIV status and barriers to care. At the 1 month follow-up visit, participants were asked if they had disclosed their HIV status to their partner, parent(s), brother(s)/sister(s), other relatives, friends, boss, or others. At the 4 month follow-up visit, participants were asked if they had told their partner or other family member about their HIV status. Participants who had identified a caretaker for their offspring in the event of death or illness were also asked if they had disclosed their HIV status to this person.

Data were restricted to participants who gave birth between November 1, 1999 and July 30, 2003, and who attended follow-up visits at 1 and 4 months. For the three participants who gave birth more than one time during this period, only data associated with the first birth were used. None of the 85 women who reported they knew they were HIV positive before their pregnancy were included in the analysis cohort.

Bivariate analysis was conducted to identify factors associated with non-disclosure to anyone between baseline and the 1 month follow-up visit, between the 1 month and 4 month follow-up visits, and between enrollment and the 4 month follow-up visit. All variables that were significant at the  $p < 0.10$  level were included in initial multivariate logistic regression models for each of these time peri-

ods, along with first-order interaction terms. A backwards algorithm was used to identify all variables to be included in the final models. Interaction terms that were significant at the  $p < 0.01$  level were retained in the model, along with their lower order terms. Remaining variables were assessed at the  $p < 0.05$  level of significance. Final models were verified using a forwards algorithm using the  $p < 0.05$  level of significance to assess main effect variable inclusion.

The study protocol was approved by the Ethical Review Committees of the Thai Ministry of Public Health and Siriraj Hospital, Mahidol University, Thailand and by an Institutional Review Board of the Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA.

## RESULTS

Of the 1,227 HIV-infected women who delivered during the study period, 799 (65.1%) were enrolled in the study. Of those who enrolled, 647 (80.0%) followed-up at 1 and 4 months. The median age of the women was 26 years (range, 16-48 years). Most had only a primary school education (53.6%) and had a household income less than or equal to US \$250 per month (82.5%). Median gestational age at the time of the first ANC visit was 4 months gestation and median number of ANC visits was 10. The majority of women were multiparous (63.0%) and diagnosed with HIV during ANC (85.2%); 14.8% were diagnosed during labor and received their test results during labor or in the immediate postpartum period prior to discharge from the hospital. Most women (92.2%) had a steady sexual partner and lived with their partners for a median duration of 2 years. The partners' median age was 30 years (range, 17-59 years); 232 (39.0%) partners had a primary school education or less, 85 (14.2%) had ever injected drugs, and 21 (3.5%) had ever had sex with another man. There were no demographic or

behavioral differences between those women who enrolled but did not complete follow-up and those who completed follow-up.

Rates of disclosure by one month of follow-up significantly increased ( $p=0.02$ ) from 65% in the study's first quarter (May 11, 1999-August 31, 2000), to 66% in the second quar-

ter (September 1, 2000-May 26, 2001), to 73% in the third quarter (May 27, 2001-April 16, 2002), to 75% in the fourth quarter (April 17, 2002-July 15, 2003).

Table 1 presents the demographic and behavioral characteristics of the 453 (70.0%) women who disclosed their status compared

Table 1  
Demographic and behavioral characteristics of women who did and did not disclose HIV status to anyone by 1 month postpartum (N=647), Bangkok, 1999-2003.

Characteristic	Disclosed (N=453)		Did not disclose (N=194)		p-value
	N	%	N	%	
Age (years)					
15-25	220	48.6	90	46.4	0.5775
26-35	213	47.0	98	50.5	
>35	20	4.4	6	3.1	
Education					
Primary or less	239	52.8	108	55.7	0.0711
High school	157	34.7	68	35.0	
Vocational	40	8.8	17	8.8	
College or higher	17	3.7	1	0.5	
Ever divorced or separated					
Yes	267	59.1	138	71.1	0.0033
No	185	40.9	56	28.9	
Missing data	1	-	0	-	
Current marital status					
Married	240	53.0	67	34.5	<0.0001
Single with regular relationship	192	42.4	98	50.5	
Single without regular relationship	21	4.6	29	15.0	
Living together (years)					
0-2	209	48.4	98	59.4	0.0158
>2	223	51.6	67	40.6	
Missing data	21	-	29	-	
Living with partner every day					
Yes	380	88.0	111	67.3	<0.0001
No	52	12.0	54	32.7	
Missing data	21	-	29	-	
Living in extended family					
Yes	162	35.8	81	41.8	0.1509
No	291	64.2	113	58.2	
Monthly household income (US\$)					
0-124	81	18.9	49	28.0	0.0323
≥125-249	300	69.9	104	59.4	
≥250	48	11.2	22	12.6	
Missing data	24	-	19	-	

Table 1 (Continued).

Characteristic	Disclosed (N=453)		Did not disclose (N=194)		p-value
	N	%	N	%	
Had antenatal care					
Yes	438	96.7	159	82.0	<0.0001
No	15	3.3	35	18.0	
First learned HIV positive					
During ANC	417	92.0	134	69.1	<0.0001
During delivery	14	3.1	22	11.3	
After delivery	22	4.9	38	19.6	
Partner ever HIV tested					
Yes	250	55.2	29	15.0	<0.0001
No	171	37.8	114	58.7	
No partner	16	3.5	22	11.3	
Don't know	16	3.5	29	15.0	
Took AZT during pregnancy					
Yes	375	82.8	116	59.8	<0.0001
No	78	17.2	78	40.2	
Partner's age (years)					
17-30	253	58.5	93	56.4	0.0796
31-45	174	40.3	65	39.4	
>45	5	1.2	7	4.2	
Missing data	21	-	29	-	
Partner's education					
Primary school or less	172	38.0	60	30.9	0.0012
High school	153	33.8	57	29.4	
Vocational	48	10.6	20	10.3	
College or more	18	4.0	7	3.6	
Unknown	41	9.0	21	10.8	
No partner	21	4.6	29	15.0	
Partner ever injected drugs					
Yes	64	16.5	21	11.9	0.0001
No	303	78.1	126	71.6	
No partner	21	5.4	29	16.5	
Missing data	65	-	18	-	
Partner bisexual					
Yes	14	3.4	7	4.0	<0.0001
No	373	91.4	137	79.2	
No partner	21	5.2	29	16.8	
Missing data	45	-	21	-	
How caught HIV					
Current partner	200	44.1	82	42.3	0.1228
Ex-partner	119	26.3	38	19.6	
Casual contact	21	4.6	17	8.7	
Injection drug user	4	0.9	5	2.6	
Blood transfusion	2	0.4	1	0.5	
Other	51	11.3	28	14.4	
Don't know	56	12.4	23	11.9	

Table 1 (Continued).

Characteristic	Disclosed (N=453)		Did not disclose (N=194)		p-value
	N	%	N	%	
Work before pregnant					
Yes	410	90.5	174	89.7	0.7492
No	43	9.5	20	10.3	
Currently employed					
Yes	166	36.7	65	33.5	0.4324
No	286	63.3	129	66.5	
Missing data	1	-	0	-	
Family planning method					
Abstinence or condoms	41	10.0	23	13.1	0.2720
Other	369	90.0	152	86.9	
Missing data	43	-	19	-	
Intend to breastfeed					
Yes	1	0.2	1	99.5	0.5538
No	452	99.8	193	0.5	
Ever missed AZT					
Yes	49	13.1	18	15.5	0.5069
No	326	89.9	98	84.5	
Missing data	78	-	78	-	
Plan to have another baby					
Yes	3	2.1	3	4.5	0.1107
No	137	95.8	58	87.9	
Don't know	3	2.1	5	7.6	
Missing data	310	-	128	-	
Age at first sex (years)					
≤16	98	21.7	41	21.1	0.0105
17-19	197	43.7	107	55.2	
≥20	156	34.6	46	23.7	
Missing data	2	-	0	-	
Number of lifetime sex partners					
≤2	329	72.6	118	60.8	0.0032
≥3	124	27.4	76	39.2	
Number of sexual partners in last year					
≤1	429	94.7	179	92.3	0.2434
≥2	24	5.3	15	7.7	
HIV-infected infant					
Yes	26	5.7	19	9.8	0.0711
No	427	94.3	175	90.2	

with the 194 (30.0%) women who did not disclose their status to anyone by one month of follow-up. Women who did not disclose their status were more likely to have had their first sexual experience before age 20, ever been divorced, separated, or single, had more than

2 lifetime sexual partners, and if they had a partner, to be living with the partner for a shorter period of time. Non-disclosers had less antenatal care, did not take AZT during pregnancy, and were more likely to have found out they were HIV positive during delivery or in the

immediate postpartum period.

Of the 194 women who had not disclosed their status by 1 month of follow-up, 48 (24.7%) disclosed their status by 4 months of follow-up (Table 2). Although few differences were seen between those women who dis-

closed "late" and those who did not, non-disclosers were more likely to have older partners.

Results from multivariate analyses are presented in Table 3. Odds ratios (OR) of the odds of non-disclosure compared with the

Table 2

Among women who did not disclose HIV status by 1 month, demographic and behavioral characteristics of women who did and did not disclose to anyone by 4 months postpartum (N=194), Bangkok, 1999-2003.

Characteristic	Disclosed (N=48)		Did not disclose (N=146)		p-value
	N	%	N	%	
Age (years)					
15-25	21	43.7	69	47.3	0.7819
26-35	26	54.2	72	49.3	
>35	1	2.1	5	3.4	
Education					
Primary or less	29	60.4	79	54.1	0.4534
High school	17	35.4	51	34.9	
Vocational	2	4.2	15	10.3	
College or higher	0	0	1	0.7	
Ever divorced or separated					
Yes	36	75.0	102	69.9	0.4914
No	12	25.0	44	30.1	
Current marital status					
Married	19	39.6	48	32.9	0.4946
Single with regular relationship	24	50.0	74	50.7	
Single without regular relationship	5	10.4	24	16.4	
Living together (years)					
0-2	24	55.8	74	60.7	0.5793
>2	19	44.2	48	39.3	
Missing data	5	-	24	-	
Living with partner every day					
Yes	24	55.8	87	71.3	0.0664
No	19	44.2	35	28.7	
Missing data	5	-	24	-	
Living in extended family					
Yes	16	33.3	65	44.5	0.1691
No	32	66.7	81	55.5	
Monthly income (US\$)					
0-124	16	37.2	33	25.0	0.1865
≥125-249	24	55.8	80	60.6	
≥250	3	7.0	19	14.4	
Missing data	5	-	14	-	

Table 2 (Continued).

Characteristic	Disclosed (N=453)		Did not disclose (N=194)		p-value
	N	%	N	%	
Had antenatal care					
Yes	41	85.4	118	80.8	0.4644
No	7	14.6	28	19.2	
First learned HIV positive					
During ANC	32	66.7	102	69.9	0.4721
During delivery	4	8.3	18	12.3	
After delivery	12	25.0	26	17.8	
Partner ever HIV tested					
Yes	9	18.8	20	13.7	0.2317
No	29	60.4	85	58.2	
No partner	2	4.2	20	13.7	
Don't know	8	16.6	21	14.4	
Took AZT during pregnancy					
Yes	28	58.3	88	60.3	0.8122
No	20	41.7	58	39.7	
Partner's age (years)					
17-30	30	69.8	63	51.6	0.0304
31-45	10	23.2	55	45.1	
>45	3	7.0	4	3.3	
Missing data	5	-	24	-	
Partner's education					
Primary school or less	16	33.3	44	30.1	0.2342
High school	19	39.6	38	26.0	
Vocational	5	10.4	15	10.3	
College or more	1	2.1	6	4.1	
Unknown	2	4.2	19	13.0	
No partner	5	10.4	24	16.5	
Partner ever injected drugs					
Yes	5	11.6	16	12.0	0.5800
No	33	76.8	93	69.9	
No partner	5	11.6	24	18.1	
Missing data	5	-	13	-	
Partner bisexual					
Yes	1	2.5	6	4.5	0.5588
No	34	85.0	103	77.4	
No partner	5	12.5	24	18.1	
Missing data	8	-	13	-	
How caught HIV					
Current partner	20	41.7	62	42.5	0.6170
Ex-partner	7	14.6	31	21.3	
Casual contact	6	12.5	11	7.5	
Injection drug user	2	4.2	3	2.0	
Blood transfusion	0	0	1	0.7	
Other	9	18.7	19	13.0	
Don't know	4	8.3	19	13.0	

Table 2 (Continued).

Characteristic	Disclosed (N=453)		Did not disclose (N=194)		p-value
	N	%	N	%	
Work before pregnant					
Yes	42	87.5	132	90.4	0.5724
No	6	12.5	14	9.6	
Currently employed					
Yes	11	22.9	54	37.0	0.0668
No	37	77.1	92	63.0	
Family planning method					
Abstinence or condoms	5	10.4	18	14.2	0.5030
Other	43	89.6	109	85.8	
Missing data	0	-	19	-	
Intend to breastfeed					
Yes	1	2.1	0	0	0.0937
No	47	97.9	146	100.0	
Ever missed AZT					
Yes	4	14.3	14	15.9	0.8350
No	24	85.7	74	84.1	
Missing data	20	-	58	-	
Plan to have another baby					
Yes	0	0	3	5.7	0.1517
No	13	100	45	84.9	
Don't know	0	0	5	9.4	
Missing data	35	-	93	-	
Age at first sex (years)					
≤16	11	22.9	30	20.5	0.9405
17-19	26	54.2	81	55.5	
≥20	11	22.9	35	24.0	
Number of lifetime sex partners					
≤2	26	54.2	92	63.0	0.2786
≥3	22	45.8	54	37.0	
Number of sexual partners in last year					
≤1	44	91.7	135	92.5	0.8584
≥2	4	8.3	11	7.5	
HIV-infected infant					
Yes	6	12.5	13	8.9	0.4779
No	42	87.5	133	91.1	

odds of disclosure by 1 month postpartum, between 1 and 4 months postpartum (in those women who did not disclose by 1 month postpartum), and at anytime during the study (bivariate data of disclosure any time during the study are not presented). There was an independent increased odds of non-disclosure by

1 month of follow-up associated with not having a partner tested for HIV (OR=5.83, 95% CI=3.19-9.08) or not knowing if the partner was ever tested for HIV (OR=13.02, 95% CI=5.26-32.28), first learning of HIV positive status during delivery (OR=6.84, 95% CI=2.36-19.81) or after delivery (OR=3.14,

Table 3

Multivariate models of characteristics of non-disclosure of HIV status by 1 month, by 4 months, and at anytime during the study, Bangkok, 1999-2003.

Characteristic	Odds ratios	95% CI	p-value
<b>Non-disclosure by 1 month postpartum</b>			
Partner ever HIV tested			
Yes	1.00	-	
No	5.83	3.19-9.08	<0.0001
Don't know	13.02	5.26-32.28	<0.0001
First learned HIV positive			
During ANC	1.00	-	
During delivery	6.84	2.36-19.81	<0.0001
After deliver	3.14	1.57-6.26	0.0004
Lifetime sexual partners			
0-2	1.00	-	
≥3	1.71	1.04-2.82	0.0331
<b>Non-disclosure by 4 months postpartum among women who did not disclose by 1 month</b>			
Living with partner every day			
Yes	1.00	-	
No	2.28	1.43-3.64	0.0005
<b>Non-disclosure at anytime during the study</b>			
Partner ever HIV tested			
Yes	1.00	-	
No	3.01	1.18-7.67	0.0211
Don't know	5.3	1.13-24.75	0.0340
Take AZT during pregnancy			
Yes	1.00	-	
No	3.75	1.67-8.42	0.0013

95% CI=1.57-6.26) and having more than 2 lifetime sexual partners (OR=1.71, 95% CI=1.04-2.82). Not living with a partner every day was independently associated with non-disclosure by 4 months postpartum in those women who had not disclosed by 1 month postpartum (OR=2.28, 95% CI=1.43-3.64).

Not having a partner tested for HIV or not knowing if the partner was ever tested for HIV was independently associated with more than a three-fold (OR=3.01, 95% CI=1.18-7.67) and five-fold (OR=5.30, 95% CI=1.13-24.75) increase in the odds of non-disclosure to anyone at anytime during the study, respectively (Table 3). Similarly, independent increased

odds of non-disclosure at anytime during the study were seen in women who did not take AZT during pregnancy (OR=3.75, 95% CI=1.67-8.42) compared with those who took AZT during pregnancy.

## DISCUSSION

In our population of HIV-infected postpartum women who first learned their HIV status during pregnancy or delivery, a substantial number (70.0%) had disclosed their status to partners, family, friends or employer by the first month postpartum visit; by the fourth month postpartum visit, 77.4% of women had disclosed their status to someone. These rates

are higher than those reported in other antenatal populations.

In a prospective study among HIV-infected pregnant women in Burkina Faso (Issiaka *et al*, 2001), the average monthly rate of disclosure to partners and others was 38% in the 8 months after voluntary counseling and testing. In a PMTCT study conducted in Tanzania, only 22% of women disclosed to someone (Kilewo *et al*, 2001) within the 18 month period following diagnosis. Other studies in developing countries, mainly focusing on disclosure by ANC clinic attendees to their sexual partners, found rates ranging from 16.7% to 65.0% (Farquhar *et al*, 2000, 2004; Antelmen *et al*, 2001; Maman *et al*, 2001, 2003; Nebie *et al*, 2001; Galliard *et al*, 2002; Kintu *et al*, 2004; Kumar *et al*, 2004).

The high rate of disclosure in our antenatal population shortly after diagnosis may be related to advances in Thailand's PMTCT and antiretroviral (ARV) treatment programs. These advances have led to decreased HIV-associated stigma in the community, recognition among those who test positive of the benefits of disclosure, and increased expertise of counselors who work with these patients. By 2000, with strong governmental support, Thailand became the first developing country to implement a national PMTCT program (Kanshana and Simonds, 2002). With the expansion of the PMTCT program, a national training curriculum was developed for nurse counselors working in the ANC setting. Counselors are taught ways to assist HIV-infected women to disclose their HIV status to their husbands and others (The Bangkok Collaborative Perinatal HIV Transmission Study Group, 1999). Shortly after the scale-up of the PMTCT program, the Royal Thai Government began to expand access to HAART for all HIV-infected persons. Specialized counseling training such as risk reduction and counseling of couples are offered to all counselors working with HIV-infected individuals. Increased counseling ex-

pertise may account for the observed increases in quarterly one-month disclosure rates seen in our study.

Few studies have assessed changes in disclosure rates over time. In a study in Kenya, 106 (32%) of 331 pregnant women had disclosed their HIV status by 2 months after their HIV diagnosis; 171 (76%) of the remaining 225 women who had not disclosed their diagnosis reported that they never intended to tell their partners (Galliard *et al*, 2002). In a population of HIV-infected pregnant women in Dar es Salaam, Tanzania over half of the women who ever disclosed to a partner their status did so within 2 months after HIV post test counseling; the disclosure rate decreased significantly after 7 months (Antelmen *et al*, 2001). Like these studies, most women in our study disclosed their status closer to the time of HIV diagnosis; 90.4% of women who disclosed their status did so by the 1 month follow-up visit. Although we did not follow the women for longer than 4 months, it seems likely that the rates of disclosure continued to decrease over time. This finding suggests that there may be a group of women who do not disclose, regardless of the amount of time passed since learning of their HIV status.

We examined characteristics associated with non-disclosure by 1 month and 4 months postpartum to understand if there were differences between women who disclosed "early" versus those who disclosed "late". We believed that women who disclosed early would benefit not only from earlier psychosocial support provided by counselors, family and friends, but also from earlier uptake of interventions designed to reduce vertical and sexual transmission. We saw few demographic or behavioral differences between the two groups, possibly because most of the women had disclosed by one month postpartum.

Key independent variables associated with non-disclosure were having more than 2 lifetime sexual partners, not having a partner

tested for HIV or not knowing if the partner was ever tested for HIV, learning about a positive HIV test result during labor or in the immediate postpartum period, and not taking AZT during pregnancy for PMTCT. These factors may reflect a lack of communication and negotiation skills needed to openly discuss sensitive sexual topics, like sexual histories. Some women may have thought there was no need to ask their partner about HIV testing because they did not perceive that they, or their partners, were at risk for HIV infection.

Women who learned they were HIV infected during delivery or in the immediate postpartum period were less likely to disclose than women who learned during ANC. It seems possible that women who were diagnosed at labor did not benefit from the ongoing psychosocial support offered to antenatal clinic attendees. Furthermore, they may not have had time to think about the impact of a positive HIV test result, and such consideration may be an important part of the disclosure process.

Our study findings could be strengthened if we had assessed at baseline, or during follow-up visits, the quantity and quality of support systems and women's ongoing relationships with their partners, families or friends. In addition, we did not ask women about positive or negative outcomes after disclosure. Often disclosure has a positive effect, and understanding outcomes may help counselors deliver appropriate messages, particularly for those women who are fearful of disclosing their status. Finally, we have no information on how women disclosed their status, or if they would have benefited from more counseling support. However, understanding these factors for women who do and do not disclose their status would allow us to further refine interventions for this population.

Based on our study findings, we have the following recommendations to improve rates of disclosure during pregnancy and in the im-

mediate postpartum period. For all women who are tested, counselors should clearly outline the benefits of disclosure, including HIV prevention opportunities, new care and treatment programs that allow access for all family members, and psychological benefits. Counselors should assess the presence of risk factors associated with failure to disclose (eg, time period living with partner, having more than 2 lifetime sexual partners, not knowing if a partner was tested for HIV, learning of one's HIV diagnosis during labor or in the immediate postpartum period, and not taking AZT during pregnancy in the population of HIV-infected women). Special interventions should be developed and considered for these women.

Women with no HIV testing during ANC may need special attention and ongoing counseling interventions. Follow-up support groups for women who have been identified as HIV infected during ANC should be considered and may need to be offered in pediatric clinics where their children are seen for follow-up. For women with partners, counseling of couples during ANC or in the immediate postpartum period may help to increase disclosure, which is especially important, since approximately one-fourth of Thai women in our study failed to disclose their HIV status to anyone within 4 months of delivery. Offering counseling to both partners may significantly extend and improve hospital counseling services.

The Thai Ministry of Public Health is exploring counseling of couples as a way to further improve results of disclosure during pregnancy. Pretest counseling of couples helps to prepare them for concordant as well as discordant test results. Couples who test negative can be given general HIV/AIDS prevention counseling to ensure that they remain uninfected. Couples who test positive can both begin to seek care for their HIV infection and begin planning for possible foster care for their children. Discordant couples can benefit

from early counseling efforts to maintain a loving partnership while preventing HIV transmission, and can take steps to ensure that their children do not become orphaned.

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