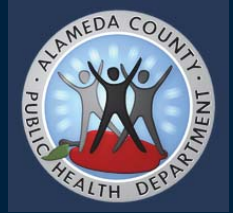




# Co-Infection with Syphilis Among People Living with HIV in Alameda County, California, 2014-2015

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## Introduction

- Among people living with HIV (PLHIV), co-infection with early syphilis may reflect ongoing risk behavior.
- Particularly for PLHIV with unsuppressed viral loads, such on-going risk behavior may contribute to ongoing transmission of HIV.

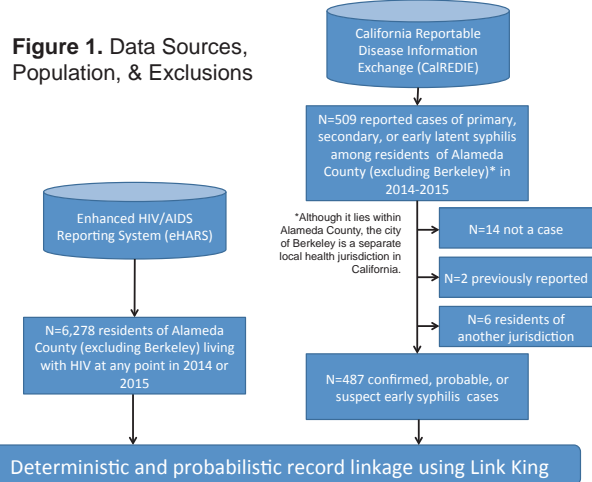
## Objectives

The objectives of this analysis were to examine:

- Characteristics associated with early syphilis co-infection in 2014-2015 among PLHIV in Alameda County, CA.
- HIV viral suppression among co-infected cases.
- The number of potential secondary HIV transmissions among co-infected cases.

## Methods

Figure 1. Data Sources, Population, & Exclusions



- To capture syphilis infections likely to have occurred after HIV diagnosis, only primary, secondary, and early latent syphilis incidents dated at least 90, 180, and 365 days after the HIV diagnosis date were considered. N=25 syphilis infections were excluded on this basis.
- Reported CD4 counts and viral loads were used as proxies for HIV medical visits.
- Differences were assessed for statistical significance using Pearson's chi-squared test for independence.

## Results

Overall, 146 syphilis infections were matched to 144 PLHIV. No co-infections were identified among female PLHIV (n=1,090), and so they were excluded from further analyses.

Table 1. Co-Infection Among Male PLHIV

	n	% Col.	Co-Infected with Syphilis		
			n	% Row	p
All	5,188	100.0%	144	2.8%	
<b>Race/Ethnicity</b>					0.026
African American	1,893	36.5%	49	2.6%	
White	1,874	36.1%	45	2.4%	
Latino	971	18.7%	28	2.9%	
Asian & Pacific Islander	318	6.1%	18	5.7%	
Other/Unk	192	2.5%	4	3.0%	
<b>Age on Dec. 31, 2014</b>					<.0001
0-12	6	0.1%	0	0.0%	
13-19	19	0.4%	1	5.3%	
20-29	487	9.4%	22	4.5%	
30-39	777	15.0%	41	5.3%	
40-49	1,331	25.7%	46	3.5%	
50-59	1,639	31.6%	26	1.6%	
60+	929	17.9%	8	0.9%	
<b>Mode of HIV Transmission</b>					0.003
MSM	3,843	74.1%	122	3.2%	
IDU	282	5.4%	1	0.4%	
MSM & IDU	369	7.1%	12	3.3%	
Heterosexual contact	394	7.6%	2	0.5%	
Unknown	300	5.8%	7	2.3%	

NOTE: MSM=man who has sex with men; IDU=injection drug use

Among male PLHIV, 2.8% were co-infected in 2014-2015; the proportion co-infected was highest among API, those aged 13-39, and MSM. Differences by race/ethnicity, age, and mode of HIV transmission were all statistically significant (Table 1).

Most co-infections among PLHIV were diagnosed at the secondary or early latent stage (Figure 2) and ≥2 years after diagnosis with HIV (Table 2).

Table 2. Time from HIV Diagnosis to First Syphilis Diagnosis in 2014-2015

Syphilis Stage	Days between HIV and syphilis diagnoses						
	≤91 days to 1 year		1-2 years		≥2 years		
	n	% Row	n	% Row	n	% Row	
All	144	3	2.1%	10	6.9%	131	91.0%
Primary	14	1	7.1%	1	7.1%	12	85.7%
Secondary	53	2	3.8%	5	9.4%	46	86.8%
Early Latent	77	0	0.0%	4	5.2%	73	94.8%

Among co-infected PLHIV, 32 (22.2%) were virally unsuppressed at most recent measurement prior to (or at) syphilis diagnosis (Figure 3).

Figure 2. Syphilis Stage Among Co-Infected PLHIV

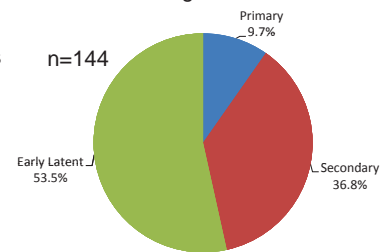
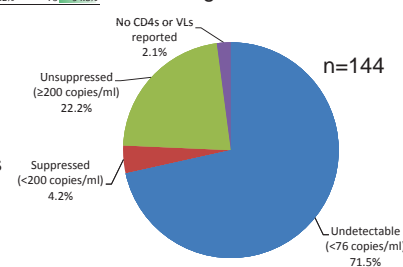


Figure 3. Virologic Status Among Co-Infected PLHIV



Among the 32 PLHIV that had been unsuppressed, 16 (50.0%) were interviewed by disease intervention specialists. A median of 2 sex partners each (IQR: 1-5.5) were identified during the period since presumed syphilis infection. A total of 59 partners were enumerated over 145 total person-months.

Among the n=131 PLHIV with syphilis ≥2 years after diagnosis with HIV:

- 88.6% had ≥1 HIV medical visits and 70.2% had ≥2 visits ≥90 days apart in the calendar year prior to diagnosis with syphilis
- 84.7% had ≥1 HIV medical visits and 64.9% had ≥2 visits ≥90 days apart in the year preceding that

## Discussion

### Limitations

- Only reported cases of syphilis could be included in our analysis; thus, co-infection may be underestimated in groups in which STD testing is less common.
- Virologic status at or prior to syphilis diagnosis may not reflect virologic status at the time of sexual encounters.
- Only half of the co-infected and unsuppressed were interviewed; they may not be representative of those not interviewed with regard to number of sex partners.
- The extent to which co-infected PLHIV and their partners represent potential secondary transmission of HIV as opposed to seroadaptive behavior is unclear since the HIV status of those partners is not known.
- The small number of co-infected persons limited further analysis characterizing this group.

### Conclusions

- Co-infection with early syphilis among PLHIV was limited to males and found to differ by race, age, and HIV transmission category, with the highest burden in Asians & Pacific Islanders, those aged 13-39, and MSM.
- Evidence of being in medical care around the time of co-infection supports the potential of interventions in clinical settings for preventing on-going sexual risk behavior, co-infections, and potential secondary transmission of HIV.
- HIV surveillance data can support tailored prevention interventions to PLHIV with early syphilis infection.

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with questions or comments