

Background

- Since 2010, early syphilis (ES) and gonorrhea rates among men have increased in New York State, excluding NY City (NYS).
- Substantial biological evidence exists demonstrating that individuals infected with an STD, such as gonorrhea and syphilis, are more likely to transmit or acquire HIV.
- Characteristics of men with repeat STD infections have not been well defined in NYS.
- The goals of this study were to determine the incidence of ES and gonorrhea re-infection among men in NYS, excluding New York City (NYC), and to identify predictors of infection patterns.

Methods

- Electronic surveillance data collected on gonorrhea and ES cases reported to the 57 NYS counties outside of NYC were analyzed for this study.
- A retrospective cohort of cases among men with a gonorrhea or ES case reported between January 1, 2006 and December 31, 2012 were used for these analyses.
- Gonorrhea re-infection was defined as an additional case report, reported ≥ 14 days after an initial incident case report. Syphilis re-infection was defined as an additional infection that met the ES surveillance case definition.
- Surveillance information on sex of sex partner is required for ES but not gonorrhea and was excluded from this analysis given the high proportion of gonorrhea cases with unknown sex of sex partner status (67%).
- Descriptive analysis, relative risks and 95% confidence intervals were calculated using SAS v9.3.

Results

Gonorrhea Re-infection (See Table 1)

Reason for visit at time of initial gonorrhea diagnosis was the strongest predictor of re-infection:

- Symptomatic individuals were **2.3 times** more likely to experience a re-infection when compared to men with only one gonorrhea infection whose reason for visit was a screening test.

Of the age groups assessed:

- 10-19 year old men were **1.9 times** more likely to experience a re-infection and
- 20-29 year old men were **1.4 times** more likely to experience a re-infection when compared to men with only one gonorrhea infection 40 years of age and older.

Of the race/ethnicity groups assessed:

- Black, non-Hispanic (NH) men were **1.9 times** more likely to experience a re-infection and
- Other, NH men were **1.4 times** more likely to experience a re-infection when compared to white, NH men who had only one gonorrhea infection.

Of the provider types assessed:

- Men diagnosed by a military provider were **0.3 times** less likely to experience a re-infection;
- Men diagnosed by a local health department were **0.7 times** less likely to experience a re-infection;
- Men diagnosed by a Health Center were **1.2 times** more likely to experience a re-infection; and,
- Men diagnosed by a Hospital were **1.4 times** more likely to experience a re-infection when compared to men who had only one gonorrhea infection and were diagnosed by a private provider.

Table 1. Characteristics of Men with Gonorrhea: Repeat Infections and Co-Infections with Early Syphilis[§] ¶

	All Men	Gonorrhea Mono-infection	Repeat Gonorrhea Infection Only	RR	95% CI	Multiple Gonorrhea and Early Syphilis Infections	RR	95% CI
All Men in Cohort	19,440	15,125	2,579			220		
Age Group								
10-19	3,607	2,796	707	1.9	1.7-2.2*	28	0.6	0.3-0.9**
20-29	9,005	7,226	1,220	1.4	1.2-1.6*	105	0.8	0.6-1.2
30-39	3,553	2,770	379	1.1	1.0-1.3	45	0.9	0.6-1.4
40+	3,270	2,328	273		reference	42		reference
Race/Ethnicity								
Hispanic	1,507	1,029	117	1.0	0.8-1.2	37	1.4	0.7-1.5
White, NH***	3,561	2,523	284		reference	86		reference
Black, NH	10,962	8,478	2,008	1.9	1.7-2.1*	89	0.3	0.2-0.4*
Other, NH	502	388	63	1.4	1.1-1.8**	6	0.5	0.2-1.0
Unknown	2,908	2,707	107	0.4	0.3-0.5*	2		
Reason for Visit								
Other	10,382	8,219	1,354	1.4	1.2-1.5*	117	0.8	0.6-1.2
Referred	1,193	887	114	1.1	0.9-1.3	22	1.4	0.9-2.4
Screening	3,890	2,980	347		reference	51		reference
Symptomatic	2,765	2,004	643	2.3	2.1-2.6*	24	0.7	0.4-1.1
Provider type								
Private MD	4,235	3,241	418		reference	66		reference
Institutionalized	757	596	77	1.0	0.8-1.3	3	0.3	0.1-0.8**
Health Center	1,701	1,234	201	1.2	1.0-1.4**	32	1.3	0.8-1.9
Military	103	92	3	0.3	0.1-0.8**	0	N A	
Health Department	5,472	4,131	871	0.7	0.6-0.7*	71	1.2	0.8-1.6
Planned Parenthood	741	651	64	0.8	0.6-1.0	4	0.3	0.1-0.8**
Hospital	5,373	4,301	814	1.4	1.2-1.6*	39	0.5	0.3-0.7*

[§] Data are not shown for men with only early syphilis infections (n=1,516).

[¶] Due to records with missing data among sub-categories, column totals may not equal the total number of men in cohort.

*p<0.001; **p<0.05; ***non-Hispanic

Multiple Gonorrhea and Early Syphilis Infections (See Table 1)

Race/ethnicity was the strongest predictor of having had both an ES and a gonorrhea infection:

- Black, NH men were **0.3 times** less likely to experience both infections when compared to white, NH men who had only one gonorrhea infection.

Of the age groups assessed:

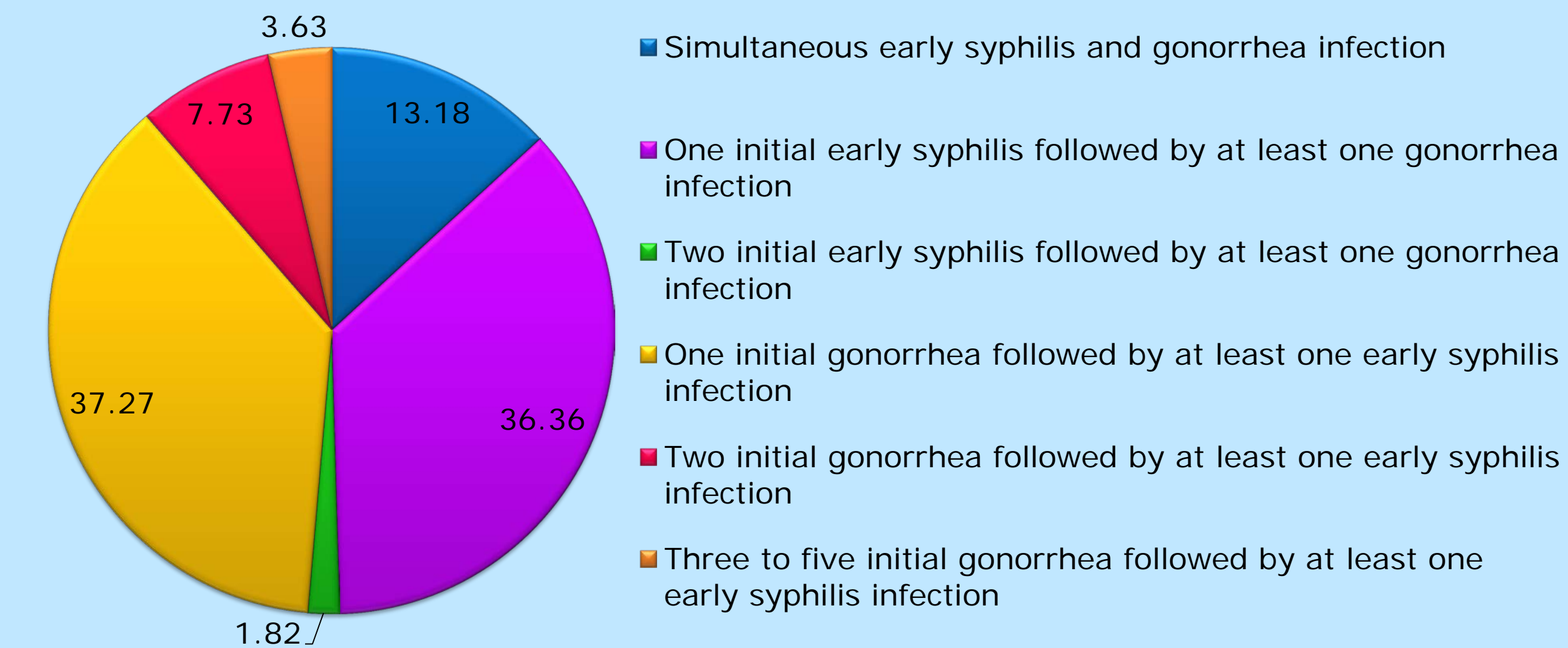
- 10-19 year old men were **0.6 times** less likely to experience both infections when compared to men 40 years of age and older who had only one gonorrhea infection

Results (continued)

Of the provider types assessed:

- Men diagnosed by a hospital were **0.5 times** less likely to experience both infections,
- Men diagnosed by a planned parenthood were **0.3 times** less likely to experience both infections, and
- Men diagnosed while institutionalized were **0.3 times** less likely to experience both infections when compared to men who had only one gonorrhea infection and were diagnosed by a private provider

Figure 1. Sequence of Initial Infection Among Men with at least One Early Syphilis and One Gonorrhea Infection (N=220 men)



Conclusions

- Men with repeat gonorrhea infections only were more likely to be young or black, NH whereas young age and black, NH race were protective factors among men who had both a gonorrhea and an ES infection. Additional analysis of sexual networks may help to explain these differences.
- Among men with at least one ES and one gonorrhea infection, 13% were simultaneously diagnosed with ES and gonorrhea.
- Recent statutory changes permitting HIV-STD data sharing will strengthen surveillance assessment of men with syndemic infections.
- A primary strength of this study was the large sample size coming from statewide population-based surveillance.
- Limitations of this study include the inability to assess sex of sex partner status of the cohort due to incomplete surveillance data, the potential for underestimating the number of re-infections in men who moved out of state and the name-based matching algorithm may have missed infections.