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Test Positivity for Chlamydia, Gonorrhea and Syphilis Infection Among a Cohort of Individuals Released from Jail in Marion County, Indiana

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Abstract

Background—Individuals entering jails have high rates of sexually transmitted infections (STI) but there are few data on STI in the post-incarceration period. This study aimed to describe rates of chlamydia, gonorrhea and syphilis infection among individuals released from Marion County (Indianapolis), Indiana jails.

Methods—We conducted a retrospective cohort study of individuals incarcerated in Marion County, Indiana jails from 2003–2008 (N=118,670). We linked county jail and public health data to identify individuals with positive STI test results in the one-year following release from jail. Rates per 100,000 individuals and cox proportional hazard analyses were performed for each STI, stratified by demographic, STI and jail characteristics.

Results—We found significantly higher rates of STI in this cohort than in the general population, with rates in the one-year following release being 2 to 7 times higher for chlamydia, 5 to 24 times higher for gonorrhea, and 19 to 32 times higher for syphilis compared to rates in the general population. Characteristics most associated with increased risk of a positive STI test among this cohort were younger age for chlamydia and gonorrhea, older age for syphilis, black race for men, being jailed for prostitution for women, history of STI, and history of prior incarceration.

Conclusions—This study found high rates of STIs among a cohort of individuals recently released from jail and identified a number of risk factors. Further study is needed to improve targeted STI testing and treatment among this high-risk population.

Keywords

Sexually transmitted infections; Jail; Incarceration; Epidemiology

INTRODUCTION

City and county jails in the United States record almost 12 million admissions and releases every year, representing 9 million unique individuals.[1] Several studies show that individuals entering jail have a high prevalence of sexually transmitted infections (STI)[2–4]; however, there are few data on STI positivity among this population following release. Given the current limitations of jail-based STI services,[5] it is likely that a portion of STI positivity in the post-incarceration period reflects untreated or undiagnosed STI acquired prior to or during incarceration as well as STI acquired post-release. Furthermore, the period following release from jail is often characterized by high-risk sexual behaviors, including unprotected sex, concurrent sexual partners, sex for money, and drug and alcohol use.[6,7] Environmental-level factors, like poverty, unemployment, and even physical neighborhood deterioration, may also impact STI risk following release from jail[8–10] but there are few data on this population.

Understanding the burden of and risk for STI following release from jail is essential to inform public health strategies on STI testing and prevention in this vulnerable population.[11–13] Untreated STI can lead to increased healthcare costs and serious health problems, particularly for women,[14] and a lack of access to STI services likely contribute to furthering a cycle of poor health and disadvantage among justice-involved individuals.[15] Using available population-level public health data, we investigated STI test positivity, including chlamydia, gonorrhea, and syphilis, and factors associated with positivity among individuals in the one-year after release from jail in a large metropolitan area.

MATERIALS AND METHODS

Study design

We conducted a retrospective cohort study of jailed men and women in Marion County (Indianapolis), Indiana with individually linked STI positive test result data to estimate the overall prevalence of chlamydia, gonorrhea, and syphilis infection and factors associated with STI positivity in the one-year period after a jail stay. There are two main jail facilities within Marion County and both are included in this analysis. These facilities do house juveniles who are charged with more serious offenses, though the majority of juvenile offenders are sent to the Juvenile Detention Center, which is not included in this analysis. Jail stay data were obtained in collaboration with the Marion County Sheriff's Office, and STI positivity data were obtained in collaboration with Marion County Health Department. Data on jail stays from July 1, 2003 – April 30, 2008 and STI positivity data from July 1, 2000 – April 30, 2009 were included. STI positivity data were included for a wider date

range so that we could obtain a history of STI infection during the 36 months prior to the first possible jail stay date, and infections diagnosed during at least the 12 months after the last possible jail release date. Individuals from jail stay data were linked to STI positivity records with identifiers including first and last name, gender, month, day and year of birth, and social security number, using a probabilistic matching algorithm described elsewhere.[16,17] Multiple probabilistic matching algorithms were performed, with different weights given to different identifiers to reduce the likelihood of dependence on a single identifier. We reviewed pair probabilities from all sets of the matching algorithm output to identify threshold probabilities above which the pairs were considered true matches. Pairs above threshold in each algorithm output were merged to identify all likely matches between the incarceration and clinical data sources. All individuals with one or more jail stays between July 1, 2003 and April 30, 2008 were included in the study, and there were no exclusion criteria. This study was approved by the Institutional Review Board at Indiana University School of Medicine in Indianapolis, Indiana with a waiver of informed consent and by the Marion County Sheriff's Office.

Measures

STI Positivity Data—The primary outcome measure for this study was a positive test result for chlamydia, gonorrhea, or syphilis in the one year after release from jail. The lack of this outcome did not imply a lack of infection, as our data source did not identify those who tested negative or individuals not tested. Positivity for the vast majority of chlamydia and gonorrhea were defined by nucleic acid amplification tests on urine, cervical swab, or urethral swab specimens, though the type of test was not specified. Positivity for syphilis (primary or secondary) was defined by rapid plasma reagin test or venereal disease research laboratory test as an antibody titer >1:8, as commonly reported elsewhere,[18] regardless of previous positive tests. In the case of a positive syphilis test, only 1 positive test result in the one-year after release from jail was included to avoid potential double counting of the same infection.

Jail Stay Data—Various demographic, clinical, and crime characteristics were described and analyzed, including gender, age, race, history of STI infection (prior 36 months to jail stay), history of previous jail stay, length of jail stay, and reason for jail stay ("charge"). Charge was categorized based on the Unified Crime Report classifications.[19] Neighborhood characteristics were described using geocoded residential address data at time of jail stay.

Analyses

Descriptive statistics were calculated using demographic, STI, jail history, and neighborhood characteristics based on the first jail stay during the study period. Rates of chlamydia, gonorrhea, and syphilis positivity per 100,000 people were calculated in the periods 12 months before and 12 months after the first jail stay and were stratified by gender, age, and race. Pre- and post-incarceration rates of STI positivity were compared as well as compared to rates published by the 2011 CDC STD Surveillance Report.[14] The results are color-coded to assist in illustrating overall trends between the three column categories: dark red indicates rates over 1,000 per 100,000; lighter red indicates rates between 100 and 999 per 100,000, orange/yellow indicates rates between 10 and 99 per

100,000, and light yellow indicates rates less than 10 per 100,000. Cells with fewer than 10 individuals are indicated by a dash (−) and were not included. Two-tailed p-values were calculated to test for significant differences in rates between pre- to post-incarceration. Cox proportional hazard analyses were performed for each STI and stratified by gender while controlling for age, race, STI history, charge, length of stay, and jail history to investigate associations between STI positivity in the post-incarceration period and demographic, clinical, and other factors. All jail stays were used for hazard analyses, censoring time after a subsequent jail stay in the same year so that time periods to the same STI were not double counted. Neighborhood characteristics were not significantly associated with STI risk in the regression model and were omitted from Cox proportional hazard analysis. The period prevalence of each STI was calculated for the one-year period after release from first jail stay, as well as second and third jail stay among individuals with multiple incarcerations during study period, to assess how rates of STI positivity change with subsequent interactions with the justice system. For simplicity, these results are only displayed for individuals of black or white race and aged 24 years or less, as these individuals generally had the highest rates of STI. All analyses were performed using STATA/SE version 10 (College Station, TX).[20]

RESULTS

Demographic characteristics

A total of 118,670 individuals were incarcerated in Marion County jails in Indiana between 2003 and 2008 and were included for analysis. At first jail stay within the study period, median age was 30 years. Over three quarters of individuals jailed during this period were men, and black individuals were disproportionately represented (42%) (Table 1). Seven percent of individuals were diagnosed with an STI in the 36 months prior to their first jail stay in the study period, with chlamydia being the most common (7%). More than half of jail stays were less than 48 hours (64%), and only 9% were greater than 30 days. Intoxication-related charges were most common, and prostitution and other sex-related crimes accounted for a small percentage of overall charges. Individuals lived in Census block groups that were disproportionally poor with high unemployment rates (mean 39%), low male-to-female ratios (73% living in block groups with a male-to-female ratio less than 1), and high proportion of female-headed households (mean 39%).

STI Positivity

Our cohort had significantly higher rates of STI compared to the general population; rates of chlamydia were between 2 and 7 times higher, rates of gonorrhea were between 5 and 24 times higher, and rates of syphilis were between 19 and 32 times higher compared to rates in the general population (Table 2). Chlamydia and gonorrhea infections were most common in young adults less than 30 years of age, whereas syphilis affected older adults, and all STI were diagnosed among blacks and women disproportionately. Compared to the general population, however, our cohort exhibited less divergence in STI rates between blacks and whites than individuals in the general population, meaning that rates of STI positivity were more similar among whites and blacks in our cohort. Also noteworthy was that black women in our cohort had higher rates of syphilis than men, whereas in the general population men

of any race have higher syphilis rates than women. STI positivity rates were similar in the one-year prior and one-year after release from jail stay with a few exceptions. Notably, adolescent men and women and white women of any age generally had higher rates of chlamydia and gonorrhea, respectively, in the one-year after release.

Adjusted Cox Proportional Hazard Ratios of STI Positivity in the 1-Year Post Release

In general, younger age (below 20 years) was associated with significantly increased likelihood of chlamydia (in men and women) and gonorrhea (in men only) test positivity in the one-year following a jail stay (Table 3). Older men and women were at greater risk for syphilis, with men 35–39 years having 6-fold greater risk and men over 50 years having a 12-fold greater risk compared to men 20–24 years of age. Compared to white men, black men were significantly more likely to have tested positivity for chlamydia (HR 3.3), gonorrhea (HR 4.0), and syphilis (HR 2.5), while black women had an increased risk only of syphilis (HR 6.0). Latino compared to white individuals was associated with a significantly decreased risk for chlamydia (in women only) and gonorrhea (in men and women), while Latino women had significantly higher risk for syphilis positivity (HR 21.3).

Previous diagnosis of STI in the 36 months prior to incarceration was the only factor that significantly increased the likelihood of all types of STI in both men and women, with more recent STI infection (less than 12 months before incarceration) associated with greater risk. Prostitution was the only charge significantly associated with all infections in women in the post-release period (chlamydia HR 2.0, gonorrhea HR 1.6, syphilis HR 2.2), while for men a prostitution charge was associated only with syphilis (HR 2.4). Drug-related charge was significantly associated with increased risk among men and women for chlamydia, but not gonorrhea or syphilis. A jail stay of longer than 2 days had a significantly decreased risk of chlamydia and gonorrhea positivity. Finally, a history of previous incarceration within the study period was significantly associated with increased risk for all STI among men and women, with the strongest increased risk associated with a more recent incarceration.

Multiple Jail Stays and STI Positivity Risk

Many individuals were incarcerated more than once over the course of the study period, with 44.7% in jail 2 or more times. Individuals with 2 or more jail stays had higher rates of STI during the 12 months before and after first jail stay, compared to the overall cohort (Table 4). For example, among all black women under 18 years of age, the period prevalence of chlamydia and gonorrhea after first jail stay was 12.2% and 4.6%, respectively. Among black women under 18 years with 2 or more jails stays, the period prevalence for chlamydia and gonorrhea after first jail stay was 29.6% and 11.1%, respectively.

DISCUSSION

Individuals with a history of a jail stay in our cohort had significantly higher rates of chlamydia, gonorrhea, and syphilis positivity both before and following jail stays compared to the general population. As expected, younger age was consistently associated with an increased risk of chlamydia and gonorrhea while older age was associated with an increased

risk of syphilis. Previous STI diagnosis, recent jail stay, and criminal charges like prostitution and drug-related offenses were factors associated with increased STI positivity.

Several findings related to race and STI positivity were inconsistent with trends in the general population. For example, for women in this cohort, black race was not a significant risk factor for chlamydia or gonorrhea. In 2011, the CDC estimated black women had rates of chlamydia 6 times the rate of white women and gonorrhea 15 times that of white women,[14] but a differential risk of STI after release from jail was not evident in this study. This finding may reflect the risk profile of incarcerated women who may be more likely to have common risk behaviors, leading to less significant differences in positivity between races. Furthermore, in 2010 black women were incarcerated (including jail and prison) at a rate 3 times that of white women.[21] As white women were disproportionately underrepresented by race, white women who *were* jailed may have had a higher risk of infection. Interestingly, black women had considerably higher rates of syphilis than black men in this cohort, perhaps reflecting increased exposure among women engaged in commercial sex.

Few studies have investigated STI among individuals recently released from jail. In a study of 178 young men released from prison, Sosman *et al.* reported that at 6 months post-release, 26% tested positive during a screening program for at least one STI.[22] In another study, Stein *et al.* found that among a group of 190 women enrolled in an alcohol intervention study, 10% tested positive for STI at 6-months post-release from a correctional facility.[23] These studies had small sample sizes and inclusion based on consent for STI testing post-release.[22,23] We did not find STI rates that reached these levels in this cohort, but we relied on public health data sources that did not include negative test results so we could not assess overall prevalence.

We did not assess risk behaviors so it is unclear whether individuals in this cohort had more, less, or similar risk behaviors prior to versus after incarceration. Studies have shown that men and women released from correctional settings often engage in high-risk sexual behaviors like unprotected sex, multiple sexual partners, concurrent sexual relationships, and drug and alcohol use in the period immediately following release, but few have pre-incarceration data.[24–26] Our finding that certain charges like prostitution and drug offenses were generally associated with increased risk of STI positivity may serve as proxy risk behaviors, and could be used as indicators to prompt more intensive jail-based STI testing post-release.

Spending time in jail may lead to offenders being cut-off from social and sexual networks maintained prior to incarceration, and to entering new, higher risk sexual networks or adopting higher risk behaviors.[27,28] It is unclear how the length of stay in jail affects these networks, given that the time spent in jail is typically only a few days, and we found that a longer jail stay (>2 days) was generally associated with a decreased risk of STI positivity after release. It is possible that individuals jailed longer than a few days were more likely to access opt-in STI testing offered through jails in Marion County, receive the necessary treatment, and thus not test positive in the one-year after release (assuming effective treatment and no reinfection). The low number of positive tests reported from jails, however,

suggests that this was a small number of individuals (per 100,000 individuals, positivity rates during jail stays in the study period were 239 for chlamydia, 162 for gonorrhea, and 21 for syphilis). Repeated incarceration was associated with significantly greater risk for STI positivity. While prospectively one does not know who will be jailed more than once, repeated incarceration could serve as an indicator for targeted STI screening at subsequent jail encounters.

Upon release and reentry into society, offenders often face difficulties finding employment and housing, suffer from higher rates of morbidities and substance abuse, and have difficulties accessing healthcare.[12,13,29] Neighborhood-level factors like unemployment, poverty, and female-headed households were not significantly associated with STI positivity when individual-level characteristics were included, however, there may not have been enough variability within this cohort to detect significant differences. Several studies among the general population have found neighborhood characteristics are associated with STI and other health outcomes, particularly among adolescents.[30,31] A study by Dembo *et al.* found that community disadvantage, as defined by 4 indicators (income level, proportion minority, female-headed households, and unemployment), was significantly associated with STI independent of individual-level factors among a group of newly arrested juveniles.[32] The association between STI and community-level factors among recent offenders should be further investigated.

There are several limitations of this study. First, since not all individuals (including those recently jailed) are screened routinely for STI, our findings are limited to those individuals who sought care within the county and received STI testing at in-county locations, and for whom positivity data were reported to the health department. Marion County has an active surveillance program in which positive STI test results are automatically reported to the health department from laboratories, limiting a reporting bias. Differential care-seeking behavior and/or screening may occur among this population, however, contributing to biased findings. Second, we did not have a number of important variables, including records of negative STI tests, data related to treatment, or individual-level socioeconomic data like health insurance status or behavioral data, although we attempted to use a number of proxy variables to investigate behavioral factors. Third, it is unknown whether all individuals in the disparate data sets were appropriately linked. Missing or incorrect data, the use of aliases by individuals, or legal name changes may affect the sensitivity and specificity of record linkages. It is also possible due to in or out migration that STI diagnoses were missed for certain individuals who were recently jailed. Finally, this analysis is restricted to a single metropolitan area and may not be generalizable to other urban communities. We had significantly smaller numbers of Latinos, especially Latino women, compared to whites and blacks. In addition, local events such as the syphilis outbreak during the study period may have influenced testing patterns, though it is unlikely to differentially affect the testing of jailed individuals as there are no standard testing procedures for this population.

This study found high rates of STIs among a cohort of individuals released from jail, but more data on factors related to STI risk, testing, and points of care among this population are needed. In the meantime, our data suggest that individuals recently released from jail will

benefit from more regular STI testing and from increased collaboration and data sharing between public health and criminal justice systems.

Acknowledgments

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Table 1

Cohort characteristics at first jail stay

	N=	%
Demographics		
Age (years)		
<18	3,776	3.2%
18–19	10,514	8.9%
20–24	24,141	20.3%
25–29	20,111	17.0%
30–34	16,008	13.5%
35–39	13,557	11.4%
40–44	21,528	10.6%
45–49	8,841	7.5%
50+	9,116	7.7%
Race/ethnicity		
White	62,055	52.3%
Black	49,970	42.1%
Latino	6,403	5.4%
Other/Missing	169	0.1%
Male	90,418	76.2%
STI history		
Years since most recent STI diagnosis		
Never	110,351	93.0%
<1 year	3,766	3.2%
1–2 years	2,560	2.2%
2–3 years	1,993	1.7%
Any history of STI diagnosis		
Any STI	11,996	10.1%
Chlamydia	8,170	6.9%
Gonorrhea	5,926	5.0%
Syphilis	973	0.8%
Jail history		
Length of stay (days)		
1–2	75,963	64.0%
3–7	20,733	17.5%
8–30	11,771	9.9%
>30	10,203	8.6%

	N=	%
Charge (at first jail stay)[*]		
violent	22,100	18.6%
property	16,265	13.7%
drug	16,104	13.6%
sex	536	0.5%
prostitution	1,176	1.0%
intoxication	28,260	23.8%
conduct	14,900	12.6%
status	1,727	1.5%
other	35,467	29.9%
	Mean	**SD**
Community characteristics (mean values based on Census block of residence)		
% black	34.3%	33.1%
% Latino	5.1%	6.0%
% below 200% of Federal Poverty Line	38.3%	18.9%
% unemployed	38.5%	12.0%
% female-headed households	39.0%	11.0%
Male:Female ratio		
<0.75	43.8%	
0.75–0.90	9.6%	
0.90–1.00	19.2%	
>1.00	27.4%	

[*] Charge was categorized using Unified Crime Report codes. For clarity, additional explanation of these classifications is included for several charge types. A violent crime charge includes four offenses: murder and non-negligent manslaughter, forcible rape, robbery, or aggravated assault. A property crime charge includes the offenses of burglary, larceny-theft, motor vehicle theft, or arson. A conduct charge corresponds to behaving in a disruptive manner (being drunk in public, for example) but presenting no serious public danger. A status charge is a violation specific to juveniles.

Table 2

Rates per 100,000 individuals of chlamydia, gonorrhea, and syphilis infection

STI	Age (yrs)	1 year prior to 1st jail stay						1 year following first jail stay						2011 - CDC STD Surveillance Data (US)					
		WHITE		BLACK		LATINO		WHITE		BLACK		LATINO		WHITE		BLACK		LATINO	
		M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F
CT	15-19	1113	5928	7297	11348	397	5769	1835*	7438*	8392*	12352	2381*	5769	207	1302	2302	7507	448	2115
	20-24	779	3705	5195	8419	619	3077	1084*	4072	5758	9339	929	769	516	1596	3662	7680	802	2675
	25-29	618	1919	3370	4960	571	-	454	2507	3301	3637	381	935	274	544	1868	2727	459	1127
	30-34	240	1527	1610	2621	589	-	271	1921	1691	2501	196	-	128	210	956	1061	236	523
	35-39	149	718	825	1439	506	-	186	1380*	778	1508	506	-	56	76	456	388	121	256
	40-44	156	348	497	545	-	-	59	463	695	778	318	-	36	33	250	167	76	124
	45-54	51	246	442	937	-	-	86	863*	379	859	366	-	17	9	109	63	35	44
	55-64	-	-	85	-	-	-	-	302	255	-	-	-	5	2	34	19	11	13
	65+	-	-	276	-	-	-	-	-	276	-	-	-	1	0	7	3	3	3
GC	15-19	392	2013	4010	4255	-	3846	701*	1902	5570*	4669	-	-	32	121	960	1930	92	188
	20-24	421	1255	4485	3997	124	-	400	2021*	4218	3219	248	1538	92	169	1875	2050	192	237
	25-29	416	1175	3491	2834	381	-	315	1410	3024	2173	190	-	71	85	1109	794	136	108
	30-34	271	591	1916	1668	196	-	383	1330*	1916	1668	491	-	48	41	635	348	81	54
	35-39	111	552	1296	960	337	-	297	1325*	1437	1576	337	-	29	19	334	143	48	27
	40-44	293	406	993	934	318	-	332	927*	1241	1167	-	-	25	10	222	65	39	15
	45-54	103	185	842	312	366	-	103	493*	695	468	-	-	14	4	125	24	22	7
	55-64	130	-	681	-	-	-	65	-	170	595	-	-	5	1	51	5	8	2
	65+	-	-	276	-	-	-	235	-	829	-	-	-	1	0	11	1	1	0
SY	15-19	21	-	111	177	-	-	62	56	56	177	-	-	1	0	21	12	4	1
	20-24	32	-	192	212	62	-	53	61	163	141	62	-	8	1	96	19	19	2
	25-29	63	39	294	661	-	-	50	39	190	425	63	-	10	1	83	12	19	1
	30-34	64	49	428	1013	-	-	16	49	652*	953	98	-	9	1	53	9	16	1
	35-39	74	166	424	1371	-	2439	56	55	518	1508	169	2439	8	0	34	6	15	1
	40-44	39	58	348	1012	318	-	98	174	397	1245	318	-	10	0	32	4	15	1
	45-54	17	62	400	546	366	-	103*	246	463	390	-	-	7	0	19	2	10	0
	55-64	65	-	340	-	-	-	-	-	-	-	-	-	2	0	6	1	3	0
	65+	-	-	552	-	-	-	-	-	276	-	-	-	1	0	2	0	1	0

Abbreviations:

M = Male

F = Female

CT = Chlamydia

GC = Gonorrhea

SY = Syphilis

- Rate ≥ 1,000/100,000
- Rate ≥ 100/100,000
- Rate ≥ 10/100,000
- Rate < 10/100,000

-     Rate not calculated (<10 individuals in cell)

*   Indicates p<.05 (based on pre/post changes > 0)

Table 3

Adjusted Cox Proportional Hazard Ratios (HR) of STI Positivity in the 1-Year Post Release

	CHLAMYDIA				GONORRHEA				SYPHILIS			
	FEMALE		MALE		FEMALE		MALE		FEMALE		MALE	
	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI
Age (years)												
<18	1.63	1.36 1.95	1.80	1.59 2.04	1.19	0.88 1.62	1.40	1.20 1.63	0.49	0.06 3.89	0.73	0.31 1.76
18–19	1.21	1.07 1.37	1.33	1.21 1.45	1.06	0.88 1.28	1.23	1.10 1.37	0.52	0.16 1.68	1.10	0.59 2.04
20–24	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF
25–29	0.71	0.62 0.82	0.68	0.62 0.74	0.75	0.63 0.90	0.76	0.68 0.84	2.83	1.32 6.07	1.30	0.82 2.05
30–34	0.55	0.46 0.65	0.37	0.32 0.43	0.77	0.63 0.95	0.60	0.52 0.68	3.99	1.81 8.77	3.24	2.00 5.27
35–39	0.40	0.33 0.49	0.25	0.21 0.31	0.60	0.48 0.76	0.48	0.40 0.56	6.35	2.94 13.70	4.12	2.56 6.64
40–44	0.28	0.21 0.37	0.16	0.12 0.21	0.37	0.28 0.49	0.42	0.33 0.53	7.90	3.66 17.05	4.00	2.37 6.74
45–49	0.25	0.18 0.35	0.11	0.09 0.15	0.26	0.17 0.40	0.33	0.26 0.42	7.27	2.92 18.08	6.13	3.40 11.06
50+	0.22	0.12 0.39	0.07	0.05 0.11	0.13	0.07 0.27	0.24	0.17 0.36	12.97	5.07 33.22	5.55	2.97 10.36
Race/ethnicity												
white	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF
black	0.98	0.88 1.10	3.26	2.91 3.65	0.91	0.79 1.05	4.03	3.50 4.65	6.02	3.36 10.80	2.52	1.61 3.93
Latino	0.52	0.32 0.85	1.00	0.78 1.29	0.26	0.09 0.75	0.64	0.43 0.94	21.30	4.08 111.28	1.67	0.72 3.84
other/missing	0.42	0.11 1.60	0.00	. .	1.92	0.41 8.96	0.00	0.00 0.00	0.00	0.00 0.00	0.00	. .
STI history (most recent diagnosis, years)												
Never	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF
<1 year	3.46	3.06 3.92	3.02	2.75 3.31	2.85	2.44 3.34	4.09	3.71 4.50	16.61	10.55 26.13	8.96	6.37 12.60
1–2 years	2.73	2.37 3.14	2.41	2.17 2.66	2.38	1.99 2.84	3.10	2.78 3.45	14.56	9.56 22.17	9.62	6.83 13.55
2–3 years	2.30	1.98 2.67	2.14	1.91 2.40	1.97	1.63 2.38	2.90	2.58 3.25	10.77	7.25 15.99	6.81	4.73 9.80
Charge												
Violent	1.05	0.96 1.16	1.04	0.98 1.11	1.03	0.91 1.16	1.10	1.03 1.18	1.22	0.86 1.73	1.09	0.89 1.34
Property	1.05	0.96 1.14	1.07	1.00 1.14	1.04	0.93 1.15	1.03	0.95 1.11	1.11	0.80 1.52	1.69	1.35 2.11
Drug	1.27	1.16 1.39	1.09	1.03 1.15	1.12	0.99 1.26	1.03	0.97 1.10	1.27	0.96 1.66	0.95	0.74 1.21
Prostitution	1.96	1.72 2.23	0.84	0.48 1.48	1.59	1.37 1.86	1.39	0.88 2.21	2.21	1.68 2.91	5.09	2.39 10.85
Intoxication	0.82	0.72 0.92	0.93	0.85 1.01	0.79	0.69 0.92	0.94	0.84 1.04	1.09	0.75 1.60	1.13	0.87 1.48

	CHLAMYDIA				GONORRHEA				SYPHILIS			
	FEMALE		MALE		FEMALE		MALE		FEMALE		MALE	
	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI	HR	95%CI
Conduct	0.99	0.90 1.10	1.10	1.04 1.16	1.01	0.88 1.15	1.06	1.00 1.13	0.98	0.71 1.37	0.93	0.75 1.17
Length of stay (days)												
1–2	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF
3–7	0.83	0.77 0.89	0.94	0.89 0.99	0.94	0.86 1.03	0.94	0.89 0.99	0.77	0.61 0.97	0.87	0.72 1.06
8–30	0.87	0.80 0.95	0.88	0.83 0.94	1.00	0.90 1.10	0.90	0.85 0.96	0.99	0.78 1.26	1.08	0.88 1.33
>30	0.88	0.81 0.97	0.83	0.78 0.88	0.87	0.78 0.98	0.84	0.79 0.90	0.91	0.72 1.14	0.99	0.80 1.22
Jail history (most recent jail stay, days)												
Never	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF	1.00	REF
<30	2.52	2.27 2.78	1.47	1.35 1.59	2.44	2.14 2.77	1.41	1.27 1.56	1.62	1.20 2.18	1.17	0.86 1.60
30–365	1.83	1.71 1.96	1.35	1.29 1.42	1.92	1.76 2.10	1.28	1.21 1.34	1.30	1.06 1.60	0.97	0.82 1.15
>365	1.27	1.17 1.38	1.08	1.02 1.15	1.34	1.21 1.49	0.95	0.89 1.01	0.86	0.66 1.14	1.05	0.88 1.24

Table 4

Rate of STIs 1-year prior and 1-year post jail stay

demographic category	1st jail stay among all individuals							1st jail stay among those with 2+ jail stays						
		1 year PRIOR			1 year POST				1 year PRIOR			1 year POST		
	N	CT	GC	SY	CT	GC	SY	N	CT	GC	SY	CT	GC	SY
black female <18yo	304	11.2%	3.9%	0.0%	12.2%	4.6%	0.0%	54	35.2%	9.3%	0.0%	29.6%	11.1%	0.0%
white female <18yo	423	8.3%	2.8%	0.0%	9.7%	2.1%	0.0%	69	18.8%	7.2%	0.0%	15.9%	8.7%	0.0%
black female 18–19yo	1,388	11.4%	4.3%	0.2%	12.4%	4.7%	0.2%	542	20.7%	7.6%	0.4%	24.0%	10.1%	0.6%
white female 18–19yo	1,365	5.2%	1.8%	0.0%	6.7%	1.8%	0.1%	436	13.1%	4.8%	0.0%	17.0%	4.8%	0.2%
black female 20–24yo	2,827	8.4%	4.0%	0.2%	9.3%	3.2%	0.1%	1,164	15.4%	6.8%	0.5%	17.0%	6.4%	0.3%
white female 20–24yo	3,266	3.7%	1.3%	0.0%	4.1%	2.0%	0.1%	1,106	9.0%	2.9%	0.0%	10.5%	4.6%	0.2%
black male <18yo	1,723	8.1%	3.6%	0.1%	9.5%	5.7%	0.1%	675	11.9%	5.8%	0.1%	13.2%	9.2%	0.1%
white male <18yo	1,181	2.1%	0.5%	0.1%	2.6%	1.0%	0.1%	304	2.6%	0.7%	0.0%	3.9%	1.6%	0.0%
black male 18–19yo	3,663	6.9%	4.2%	0.1%	7.9%	5.5%	0.1%	2,365	9.0%	5.2%	0.2%	10.2%	7.3%	0.1%
white male 18–19yo	3,670	0.8%	0.4%	0.0%	1.6%	0.6%	0.1%	1,577	1.5%	0.4%	0.0%	3.2%	1.0%	0.1%
black male 20–24yo	6,756	5.2%	4.5%	0.2%	5.8%	4.2%	0.2%	4,377	6.9%	6.0%	0.3%	7.5%	5.9%	0.2%
white male 20–24yo	9,504	0.8%	0.4%	0.0%	1.1%	0.4%	0.1%	3,731	1.4%	0.8%	0.1%	2.1%	0.8%	0.1%
others	82600	0.9%	0.9%	0.2%	1.0%	0.9%	0.3%	36697	1.7%	1.6%	0.5%	1.8%	1.8%	0.5%

demographic category	2nd jail stay							3rd jail stay						
		1 year PRIOR			1 year POST				1 year PRIOR			1 year POST		
	N	CT	GC	SY	CT	GC	SY	N	CT	GC	SY	CT	GC	SY
black female <18yo	26	50.0%	19.2%	0.0%	34.6%	19.2%	0.0%	-						
white female <18yo	30	20.0%	10.0%	0.0%	26.7%	13.3%	0.0%	-						
black female 18–19yo	319	25.1%	11.6%	0.3%	22.9%	11.3%	0.0%	107	37.4%	14.0%	0.0%	18.7%	10.3%	0.0%
white female 18–19yo	305	15.7%	6.2%	0.3%	17.4%	5.2%	0.3%	132	20.5%	7.6%	0.0%	25.0%	7.6%	0.8%
black female 20–24yo	1,223	14.4%	8.2%	0.2%	17.3%	6.5%	0.3%	622	17.7%	10.5%	0.3%	15.4%	7.9%	0.5%
white female 20–24yo	1,106	10.6%	3.8%	0.0%	9.5%	4.8%	0.2%	595	10.9%	5.4%	0.0%	14.6%	7.7%	0.3%
black male <18yo	330	18.5%	7.0%	0.6%	16.4%	10.3%	0.0%	104	24.0%	9.6%	1.9%	24.0%	12.5%	0.0%
white male <18yo	111	0.9%	2.7%	0.0%	5.4%	3.6%	0.0%	24	0.0%	4.2%	0.0%	12.5%	4.2%	0.0%
black male 18–19yo	1,988	10.6%	6.5%	0.2%	11.8%	8.4%	0.1%	1,223	11.3%	9.9%	0.2%	12.7%	10.3%	0.3%

demographic category		1st jail stay among all individuals								1st jail stay among those with 2+ jail stays						
		1 year PRIOR			1 year POST					1 year PRIOR			1 year POST		
	N	CT	GC	SY	CT	GC	SY		N	CT	GC	SY	CT	GC	SY
white male 18–19yo	1,228	3.1%	0.8%	0.0%	3.2%	0.9%	0.0%		619	4.2%	1.3%	0.0%	4.4%	0.6%	0.0%
black male 20–24yo	4,373	7.9%	6.4%	0.2%	7.5%	6.0%	0.2%		3,174	8.9%	7.6%	0.2%	8.3%	7.0%	0.2%
white male 20–24yo	3,592	2.1%	0.8%	0.1%	2.2%	0.7%	0.1%		2,061	2.7%	1.2%	0.0%	3.1%	1.2%	0.1%
others	38466	1.7%	1.8%	0.4%	1.9%	1.8%	0.4%		24315	2.1%	2.4%	0.5%	2.5%	2.2%	0.5%

Abbreviations:
CT = Chlamydia
GC = Gonorrhea
SY = Syphilis