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Identification of risk factors associated with new HIV infection in an Atlanta jail: A cross-sectional study between January 2011 and March 2012

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An abstract of
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Abstract

Identification of risk factors associated with new HIV infection in an Atlanta jail: A cross-sectional study between January 2011 and March 2012

By Mingli Qi

With neither a preventive vaccine nor a cure, HIV/AIDS has been one of the leading causes of death worldwide for decades. Even in the ART (anti-retroviral therapy) era, millions still live with HIV and worldwide about 1 million people are infected annually. Finding newly infected cases and treating all infected persons with ART is a key step to reduce the chance of spreading the virus in the surrounding community. People in jails and prisons experience much higher HIV prevalence than the general population. Therefore, finding new cases in correctional facilities becomes a crucial step to reduce disease burden in the whole society. In this study, we sought to identify risk factors associated with the detection of new HIV cases in an Atlanta jail between January 2011 and March 2012. The staff nurses at the jail adopted an opt-out approach to test 19,285 individuals using the OraQuick ADVANCE Rapid HIV-1/2 Antibody Test system. From the testing data, we identified 419 individuals who had positive HIV results during the 15-month period. Among these 419 HIV positive persons, 42 were clarified as new HIV diagnoses. The overall HIV prevalence of those tested during this period was 2.17% and the prevalence of new diagnoses was 0.22%. We did not find that age, race/ethnicity and drug charge were associated with new HIV cases. Further analysis demonstrated that sex had a weak association with new HIV detection ($p=0.07$, Pearson's χ^2 test) while booking frequency was strongly correlated with new HIV detection in our jail population across this 15-month period. Bivariate analysis showed that this relation was statistically significant. The odds ratio for booking at least 3 times was 3.46 with 95% confidence interval {1.23, 9.73}, and a p-value of 0.02. The odds ratio for booking at least 4 times was 6.73 with 95% confidence interval {1.61, 28.10}, with a p-value of 0.01.

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Identification of risk factors associated with new HIV infection in an Atlanta jail: A cross-sectional study between January 2011 and March 2012

Introduction

HIV/AIDS has been one of the leading causes of death worldwide for decades. Even in the ART (anti-retroviral therapy) era, millions still live with HIV and worldwide about 1 million people are infected annually (1). Finding the new infected cases and treating them with ART is a key step to reduce the chance of spreading the virus in the surrounding community. In 2006, the Center for Disease Control and Prevention (CDC) recommended routing HIV testing in health care settings including correctional facilities (2-4).

The state of Georgia has one of the highest prevalence for HIV nationwide. In 2014, Georgia has 55,000 current HIV infections, which ranked Georgia number 5 in total cases in the US (5). In 2016, Georgia leads the United States in HIV incidence for adults and adolescents, at 31.8 per 100,000 people according to a report from CDC. Another noticeable phenomenon in Georgia's HIV surveillance is that high prevalence overlaps with the incarcerated population due to high incarceration among the demographics at highest risk on HIV. More men than women, more Black than White, more poor people and persons who use drugs and engage in transactional sex are incarcerated (6). Nationwide one in seven people living with HIV (PLWH) in 2006 had been incarcerated

(7). A study implemented by Anne Spaulding's group at Emory University found that the overall HIV prevalence was more than 2.8% in Atlanta-Fulton county jails while the total HIV prevalence was 0.36% in the US general population (8).

Currently, 3% adults in the U.S. are under criminal justice supervision. Although HIV testing rates in federal and state prisons are generally high, testing data in jails are lacking. Studies revealed that in 2012, 15.8% of PLWH in the United States are unaware of their HIV diagnosis (6). An even higher percentage of this population are not engaged in active care and antiretroviral therapy (ART). The development of effective approaches to increase HIV diagnoses and guiding PLWH in subsequent steps of treatment and care could lead to earlier and sustained viral suppression. Improvements in HIV testing in this high prevalence environment have the potential to benefit the health of PLWH and improve public health by reducing HIV transmission. CDC recommends frequent HIV testing of detainees in the correctional system because PLWH who are aware of their HIV status are more likely to seek medical treatment and less prone to spread HIV. These actions could lower the potential for HIV transmission and reduce HIV-associated morbidity and mortality.

One of the challenges in adopting a routine HIV testing in jails is the rapid turnover rates. The median stay in a jail is only 2-5 days. Testing in the first couple of days will target the most inmates (9). The point of care test, a rapid HIV testing-preliminary result can now be obtained in around 60 seconds is more suitable in this scenario than the conventional testing which usually need hours or days to turnaround (8). To increase the

cost-effectiveness of the testing, screening the inmates with highest odds of infection is desired. Reports have demonstrated that certain arrest charges, people with color, and high arrest frequencies are among the indicators for a positive HIV detection (10,11).

Despite the overall high HIV prevalence in jails and CDC's recommendation, most HIV testing programs in criminal justice settings are focusing on the testing among prisoners, and routine HIV testing in jails is not common (12). More importantly, 95% of the total U.S inmates only pass through jails but not prisons. Therefore, jail-based routine testing is more strategic and effective to identify HIV infected individuals in correctional facilities (13). Studies have shown that in hospitals and clinics nurse-led screening have higher participation rates than the physician-led screening programs. In jail settings, a nurse tends to be more actively involved in regular clinical services and infectious disease testing programs. Nurse-leaded HIV testing in jails has shown great success in Fulton County Jails (FCJ) in the Atlanta area and elsewhere (14).

Another prevalent viral disease in the correctional setting is hepatitis C, which is the most common blood-borne infection in the United States. Studies estimates that during 2013-2016 1.7% ({95% CI}, 1.4-2.0%) of all adults in the United States, approximately 4.1 (3.4-4.9) million persons, were HCV antibody-positive (15). In some patients, HCV infection progresses to chronic liver disease and liver cancer, which are the leading cause of liver-related mortality (16). Surveys show that among those with chronic HCV infection, only about half are aware of their status. Reports have shown that HCV as well as other sexually transmitted diseases such as chlamydia, gonorrhea, and hepatitis B

are associated with HIV positivity in some community settings. Furthermore, HIV and other STDs could amplify the transmission and acquisition of each other. Researchers pointed out that this epidemiology synergy may explain the explosive growth of the HIV pandemic. STD control programs maybe a key step in controlling HIV transmission in these special communities (17).

Since effective treatment prevents HCV-related morbidity and mortality, early detection of HCV infection has become a key step. In 2016, about 10 million people were detained in US jails or prisons. Recent estimates have found that about 17.4% of incarcerated people are anti-HCV positive (18). This translate s to roughly 1.7 million HCV cases in incarcerated population. HCV screening within jails, and linking cases to medical treatment, will prevent HCV-related morbidity and mortality in thousands of infected people.

Fulton County Jail in Atlanta is one of the 50 largest jails of the nation in terms of total population size-- roughly 2000 detainees are held daily (19). Between January 1, 2011– March 15, 2012, the jail implemented a demonstration project in partnership with Emory University to integrate routine rapid HIV and HCV testing into the medical intake process. This collaboration offered testing for roughly 19,000 persons for HIV and 4831 persons for HCV and collected data on variables such as age, race/ethnicity, criminal charges and willingness to test at the time of booking (8). The staff nurse at the FCJ initially used the OraQuick ADVANCE Rapid HIV-1/2 Antibody Test (OraSure Technologies, Bethlehem PA) to detect antibodies to HIV-1 and/or HIV-2 in an oral fluid specimen. This second-generation, CLIA-waived rapid HIV test provides results in 20

minutes, enabling patients to learn their status in a single visit and allows HIV positive patients to be connected to care immediately (20). The OraQuick ADVANCE Rapid HIV-1/2 Antibody Test provides greater than 99% agreement with confirmatory Western blot. This test offers patients accurate HIV testing without the need for blood or needles. Pain-free testing with oral fluid means more people are screened, more HIV positive patients are connected to care and fewer people are exposed.

An earlier study, involving four state health departments (Florida, Louisiana, New York, and Wisconsin) collaborated with jails to implement stand-alone voluntary rapid HIV testing programs, has shown that rapid HIV testing in jails identified a considerable number of previously undiagnosed cases of HIV infection. In a multivariate analysis, new HIV diagnoses were associated with Black men, especially Black MSM experience higher infection rates and worse HIV-related health outcome (21). Another study in Rhode Island has shown that nonwhite race, and prior incarceration were associated with seropositivity (11). Therefore, in our study, we searched for potential indicators, such as race/ethnicity, drug-related charges and reincarceration/bookings, for new HIV infection among people in incarceration.

Analysis of our testing results and indicator variables may provide clues to how to predict who is most likely to be found positive, thus potentially reducing the total cost for testing. At the same time, testing can lead to offering early treatment in jails. Jails can offer services promoting linkage to care once PLWH have been released to the surrounding communities.

Methods

Study Population From January 2011 to March 2012, the Fulton County Jail system together with Emory University conducted a demonstration project to integrate routine rapid HIV and HCV testing into the medical intake process. Using the testing results, we designed this cross-sectional study to identify the predictors for new HIV detection in a jail setting. The dataset used in this study contains records of roughly 19,425 unique booking- numbers in the FCJ system during the 15-month study period. Further data cleaning indicates that there were total 19,285 unique individuals in the dataset. For these 19,285 unique subjects, besides the opt-out HIV testing, some inmates were provided with tests for sexually transmitted diseases at the late stage of the testing process. A total of 1488 inmates were tested for chlamydia; 1492 inmates were tested for gonorrhea; 6177 inmates were tested for hepatitis B viral infection, and 4821 inmates were tested for hepatitis C viral infection. The jail management, in conjunction with researchers from Emory University, Rollins School of Public Health, recorded the sex, age, race/ethnicity, charges related to the incarceration, the HIV testing results, and tests results of the aforementioned sexually transmitted diseases. Other variables including the booking dates, booking numbers were also recorded.

All inmates testing preliminarily positive were asked to provide a venous blood specimen for confirmatory testing. Only inmates with positive Western blot tests are considered confirmed as HIV-positive in this report. Whether a HIV diagnosis was new or previously made was determined by jail health staff subsequently submit a case report to the Georgia State Registry of HIV. Persons with preliminary positive tests and negative

Western blots were reclassified as HIV-negative and were not included in the subsequent counts of HIV-positive persons.

This study is a secondary data analysis using existing data collected from the jail testing. The Institutional Review Boards at Emory University reviewed the study and determined that it was public health practice rather than human subjects' research.

Dependent variables The main outcome for this analysis was the identification of new HIV infection. Incarcerated persons in the study were give an option to undergo opt-out HIV testing using the OraSure quick detection system. Their self-reported HIV statuses have been reported in the dataset. A new HIV diagnosis was defined as no known previous HIV positive results for a given person until a positive result in the jail testing and confirmed by the Georgia State Registry of HIV.

Independent variables To identify the possible indicators for a new positive HIV detection, we examined each inmate's age, sex, and race/ethnicity. Other studies have shown that the length of stay in the jail system, charges of drug possession, and arrest frequencies in a given time-frame was associated with the HIV testing results; so, we also included these variables in the analysis. We further divided age into quintile groups and 5-year age groups. To determine if other STDs are predictors for new HIV detection, we created variables for chlamydia, gonorrhea, hepatitis B, and hepatitis C.

Statistical analysis The first aim was to characterize the age, sex, and race distribution in the dataset. The median and average for continuous numeric variables were computed

using SAS statistical software. Similarly, the percentage distributions of categorical variables were also calculated.

The second aim was to test the association between each independent variable and the outcome variable. We used Pearson's χ^2 test to assess associations of categorical variables and for continuous variables such as age. We divided age into category subgroups. For the entire data analysis, we set alpha values at 0.05.

The third aim was to establish the odds ratios for different groups with unique values for their covariates. We used logistic regression modeling for this process. The covariates were usually coded as dichotomous if they were categorical variables or we used the class function in the analysis for continuous variables such as age. The significance of the odds ratios was determined by the p-value associated with the Wald test.

We also analyzed if there were associations between HIV detection and other STDs. For this purpose, primarily Pearson's χ^2 test was used to determine the significance of the association.

Lastly, we establish a multivariate model to predict the HIV testing result. We used forward + backward selection process for the covariates. In order to be selected to enter in the model, a p-value of 0.2 was used. To stay in the model in the elimination step, a p-value of 0.3 was used. A built- in Macro-SAS program in the Rollins School of Public Health server was used to dissect the collinearity issue in the initial model step. The Hosmer-Lemeshow test was used to measure the fitness of the model.

Results

Overview of the dataset From the testing results, the team identified 419 individuals who had positive HIV results during the 15-month period. Among these 419 HIV positive persons, 42 were clarified as new HIV detections. The overall HIV prevalence of those tested during this period was 2.17% and the prevalence of new infects was 0.22%.

Demographics of the inmates Among these 19,285 incarcerated people, 15,217 (78.9%) were men, 4068(21.1%) were women. When divided by age groups, 1632(8.5%) inmates were less than 20 years of age, and 1093(5.7%) inmates were 55 years or older. The majority (85.8%) of the persons in the jail were between 20 and 55 years old. The detailed distribution of age is listed in Table 1.

When considering race/ethnicity, we divided our study subjects-19,285 people incarceration into five groups as shown in Table 1. 1) White, this group has 2357 subjects accounted for 12.22% of total person incarcerated; 2) Black, 16164 people incarcerated are in this category, they made up to 83.82% of the total subjects in this study; 3) Hispanic, around 659 subjects or 3.42 % of the total incarcerated people are belong to this group; 4)Others, includes all Asians irregardless of their country of origin and the native Americans; 5) Unknown, includes all unspecified individuals in this incarcerated population.

Bivariate analysis for new HIV detection For this analysis, we mainly used the chi-square and associated p-values to evaluate the significance of selected indicators. We first show the frequency of sex and its association with new HIV detection. As seen here

in Table 2, among 1064 women tested in the jail during the study period, only 4 new HIV cases have been detected. While females accounted for 21.1% of the total people in incarceration, they only contributed to 10.0% of the new HIV cases. However, the p-value associated with this proportion is 0.066, a non-significant association.

Next, we tested if age is associated with new HIV detection. For this purpose, we dichotomized age into two categories: older or younger than the median (32 years old). We found that p-value is 0.53 indicating that Age is not a risk factor for new HIV detection if divided at median. Similar result was received if we dichotomize age at average (34 years of age). Since age is reported as a risk factor for HIV prevalence, we further dichotomized age using quintiles. However, none of these efforts yielded a significant association between age and new HIV detection.

In order to test if drug associated charge is associated with new HIV detection, we divided the subjects into two groups according to if there is any drug-related charge presented in their arrest records. We found 10 new HIV cases in our incarcerated population, and the p-value is 0.18, not a significant risk factor for new HIV detection.

We tested if the length of stay for incarcerated people is an indicator for new HIV detection. We dichotomized the length of stay for all the people in incarceration into two categories according to if the length of stay is over 48 hours. Thirty-four subjects stayed longer than 48 hours in the related booking have been detected positive for new HIV positive. However, Chi-square analysis result show that the p-value is 0.15 indicating a non-significant association.

Race/ethnicity are also used in the data analysis, we divided our subjects into White/non-White, Black/non-black, Asian/non-Asian groups etc. similarly as the aforementioned variables, these dichotomizations do not yield any p values less than our preset alpha. Therefore, none of the race/ethnicity indicators could serve as risk indicators for new HIV detection.

Lastly, we tested if the overall booking frequencies during this period are associated with a new positive HIV detection. This time, the Chi-square analysis yields significant p-values, 0.01 and 0.003 respectively for inmates who were booked 3 or 4 times during this period. The p-value associated with 2 times of booking is 0.06, very close to the 0.05 marker for significance.

Odds and odds ratio analysis for covariates After analyzing the potential risk factors listed in table2 for significance, we next conducted logistic regression modeling to find what the odds ratios associated with our risk factors were, and more importantly, if the two statistic methods we used agreed to each other. In other words, we wanted to check if the p-values produced by these two methods are same. This step will verify our χ^2 assay and assure us that we did not overlook real risk factors for new HIV detection.

Briefly, we ran logistic models with only one of the listed covariates as independent variable without adjusting any other factors. All the odds ratios, confidence intervals and p-values are listed in table3 bellow. Again, we confirmed that sex, age, LOS, drug charge, and race/ethnicity were not risk factors for new HIV detection in this incarcerated

population. The odds ratio associated confidence intervals contain the null value '1' and a p-value more than 0.05.

With this different approach, we were able to identify that booking frequency is a true indicator for new HIV detection. The odds ratio for book>=2 is 1.95 with 95% confidence interval {0.96, 4.0}. The p-value is 0.07, a little more than the 0.05 marker. The odds ratio for book>=3 is 3.46 with 95% confidence interval {1.23, 9.73}. The p-value is 0.02, indicating a statistical significance. Similarly, the odds ratio for book>=4 is 6.73 with 95% confidence interval {1.61, 28.10}, the p-value is 0.01.

New HIV detection and other sexually transmitted diseases To test if other STDs associated with HIV infection, we did Pearson's χ^2 analysis for our incarcerated population. We have tested 1494 individuals for their chlamydia infection and found 107 people (7.16%) are positive for chlamydia. In this 1494 people, only 6 of them are new HIV positive during the one year 3 months period. When we placed these numbers into a 2X2 table, the Pearson's χ^2 analysis result shows that chlamydia is not associated with new HIV detection. With a p-value of 0.50, we conclude that chlamydia positivity is not an indicator for new HIV positivity.

We also did Pearson's χ^2 assay for association between gonorrhea and new HIV detection. With a p-value of 0.70, we conclude that concurrent gonorrhea positivity during the study period is not associated with new HIV infection. We used the same method to test if hepatitis B or hepatitis C positivity is associated with new HIV

infection, with p-value of 0.11 and 0.37 we excluded these two viral infections from the list of potential indictors of new HIV infection.

New HIV detection and other sexually transmitted diseases among female population we payed special attention for the association between STDs and new HIV positivity in female population. We stratified the data for females in the dataset and did Pearson's χ^2 assay as in Table 4. All the p-values for the four STDs are far more than our cutoff value-0.05. So, even in the female population, none of the four STDs listed in table5 are associated with new HIV detection.

Logistic Modeling for New HIV detection indictors We listed all potential covariates (listed in Table 2.) for new HIV infection in the logistic regression model and set entry p-value at 0.2 and stay p-values at 0.3. After excluding the collinearity issue, we were able to identify sex and booking frequency as the only two indicators for new HIV detection in our jail population.

Discussion

Undiagnosed HIV infections are a major cause of the HIV transmission thus finding the new HIV cases is a critical step combating HIV epidemic (22). By analyzing the testing data from Fulton County jails, we have demonstrated that using the OraSure Quick HIV testing system was effective in finding new HIV cases. We found 419 total positive HIV cases with a calculated prevalence of 2.17% from the total 19,285 inmates. We have confirmed 42 new HIV cases from this population, with a prevalence of new infection of 0.22% for this 15-month period. The overall cost to identify a new case will be high with such a low yield from testing in this population. Given that each infection averted saves society $500,000, if every 15 new cases diagnosed means one less HIV transmission, then it should be cost-effective, if not cost-saving.

Overall, the HIV prevalence in incarcerated populations nationwide is 1.5%, about 3 times higher than the US general population (19,23). It is strategically sound to deploy HIV testing programs in areas of high HIV prevalence such as jails and prisons. Recently, there has been more and more recognition that a substantial number of HIV infected individuals have regularly interacted with the justice system (7). This same group of people tends to be poor, non-white, and abuse substances (24). However, we did not find race/ethnicity and drug charge are associated with new HIV cases. Instead our analysis identified sex and booking frequency are correlated with new HIV detection in our jail population across this 15-month period. Bivariate assays using Pearson's χ^2 and logistic regression both showed that this relation was statistically significant.

Although previous studies demonstrated that age, race/ethnicity, drug charges, length of stay, and other sexually transmitted diseases are indicators for new HIV detection (10,11,13,25,26), none of those factors stands out in our analysis. One reason for this discrepancy maybe due to that our small dataset contains only limited numbers of new HIV cases. To explore why results are discrepant, a longer testing/observation period would have been needed. This approach would likely have increased the new HIV diagnosis in our dataset. With more case numbers, our two methods would probably yield statistically significant results for some of the other covariates.

For the association between other STDs and new HIV detection, following the subjects longitudinally could be predictive of future HIV transmission. STDs cause purulent discharge, which can increase the risk of both acquisition and transmission of HIV. All these effects on increased HIV infection may need longer observation time of individuals. Also, we are now in an era of PrEP; the wide use of prophylactic antivirals greatly reduces the likelihood of HIV transmission, even in the setting of a STD.

Our analysis has shown that the odds for a new HIV detection is much higher among the male inmates than the females. This is a quite common finding in other studies targeting jail or prison populations (10,27). One well accepted explanation is that a main cause of HIV spreading is the sex activities among men who have sex with men (28). We did not collect variables involving sexual behaviors, otherwise we could potentially identify the causes of this higher odds for new HIV detection in males.

Our analysis is limited to these 19,285 subjects incarcerated in the Fulton County Jails during this study period. Generalization to other populations and institutionalized

populations elsewhere may not be valid. The sex, race/ethnicity, age distributions and prevalence of undiagnosed HIV cases may vary greatly in other settings.

To our knowledge, this may be the first report to link the booking frequency and new HIV diagnosis, while our data clearly shows a correlation between these two. Ideally, if the number of new HIV cases among frequent visitors were higher, the statistical significance would be more convincing. We speculate that the higher odds for new HIV acquisition among frequent visitors may be explained by their risks while dwelling in the surrounding community.

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Table 1. The Counts, Percentage of Age Categories, Gender and Race/Ethnicity Distribution for Individuals Tested in Fulton County Jails from Jan 2011 to Mar 2012

Variable	Category	Numbers	(Percentage)
Age	<20	1632	8.46%
	20-29	6732	34.91%
	30-39	4770	24.73%
	40-54	5058	26.23%
	55+	1093	5.67%
Gender	Male	15217	78.91%
	Female	4068	21.09%
Race/Ethnicity	White	2357	12.22%
	Black	16164	83.82%
	Hispanic	659	3.42%
	Other	99	0.51%
	Unknown	6	0.03%

Table 2. Bivariate Analysis of New HIV Detection for Individuals Booked in Fulton County Jails from Jan 2011 to Mar 2012

	New HIV Testing Positive		New HIV Testing Negative		
Indicators	Frequency	Percentage	Frequency	Percentage	Chisq P-value
Female	4	0.10	4064	99.90	0.0658
Age>32(median)	18	0.20	9183	99.80	0.5284
Age>34(average)	17	0.20	8688	99.80	0.5433
Age_bottom20%	7	0.18	3791	99.82	0.6214
Age_bottom40%	20	0.26	7751	99.74	0.3327
Age_bottom60%	26	0.23	11476	99.77	0.7648
Age_top40%	16	0.21	7767	99.79	0.7648
Age_top20%	6	0.16	3863	99.84	0.3494
Length of Stay>48h	34	0.25	13614	99.75	0.1464
Drug Charge	10	0.32	3114	99.68	0.1802
White	4	0.17	2353	99.83	0.5930
Black	37	0.23	16127	99.77	0.4510
Hispanic	0	0.00	659	100.0	0.2223
Asian	1	1.01	98	98.99	0.0900
Booked>=2 times	10	0.37	2661	99.63	0.0614
Booked>=3 times	4	0.70	568	99.30	0.0121
Booked>=4 times	2	1.39	142	98.61	0.0025

Table 3. Odds for Covariates Analysis of New HIV Detection in Individuals Booked in Fulton County Jails from Jan 2011 to Mar 2012

Indicator	Odds ratio	Lower 95%CI	Upper 95%CI	Chisq P-value
Female	0.393	0.140	1.102	0.0760
Age>32	0.822	0.446	1.515	0.5291
LOS>48h	1.757	0.813	3.798	0.1517
Drug Charge	1.619	0.795	3.296	0.1844
White	0.756	0.270	2.119	0.5947
Black	1.430	0.562	3.641	0.4534
Hispanic	<0.001	<0.001	.	0.9813
Asian	4.765	0.649	34.984	0.1247
Booked>=2times	1.948	0.956	3.966	0.0662
Booked>=3times	3.462	1.232	9.732	0.0185
Booked>=4times	6.726	1.610	28.096	0.0090

Table 4. New HIV Detection and Distribution by other STDs for Individuals Booked in Fulton County Jails from Jan 2011 to Mar 2012.

		New HIV Testing Positive		New HIV Testing Negative		
STD	level	Frequency	Percentage	Frequency	Percentage	Chisq P-value
Chlamydia	Negative	6	0.40	1381	92.44	0.4954
Chlamydia	Positive	0	0	107	7.16	.
Gonorrhea	Negative	6	0.40	1455	97.13	0.6961
Gonorrhea	Positive	0	0	37	2.47	.
HepB	Negative	5	0.08	4201	67.89	0.1092
HepB	Positive	6	0.10	1976	31.93	.
HepC	Negative	10	0.21	4458	92.28	0.3669
HepC	Positive	0	0	363	7.51	.

Table 5. New HIV Detection and Distribution by Other STDs Among Women Booked in Fulton County Jails from Jan 2011 to Mar 2012.

		New HIV Testing Positive		New HIV Testing Negative		
STD	Level	Frequency	Percentage	Frequency	Percentage	Chisq P-value
Chlamydia	Negative	1	0.07	1290	92.47	0.7765
Chlamydia	Positive	0	0	104	7.46	.
Gonorrhea	Negative	1	0.07	1358	97.35	0.8707
Gonorrhea	Positive	0	0	36	2.58	.
HepB	Negative	1	0.08	716	60.78	0.7527
HepB	Positive	1	0.08	460	39.05	.
HepC	Negative	1	0.11	823	92.47	0.7770
HepC	Positive	0	0	66	7.42	.