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HEPATITIS C INFECTION AMONG HISPANICS IN CALIFORNIA

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Abstract

Introduction—Hispanics in California are more likely to be infected with hepatitis C (HCV), and those infected have had their infection detected later.

Methods—1567 Hispanic and White-Non Hispanic individuals were tested for antibodies to HCV from 2000 through 2013. Trained interviewers administered the Risk Behavior Assessment.

Results—HCV-infected Hispanics were incarcerated longer, used marijuana fewer and illicit methadone more, days than HCV-infected Whites. They were more likely to use crack, heroin, speedball, and to have been in methadone treatment.

Discussion—Hispanics need HCV testing linked to methadone treatment, and written information in Spanish and English describing prevention, and treatment of HCV.

Keywords

Hepatitis C; Hispanic; Risk Assessment; Methadone

Introduction

Hepatitis C (HCV) is a form of viral hepatitis transmitted in infected blood that causes chronic liver disease. Unlike the number of acute Hepatitis A and B cases that are declining, the number of acute HCV cases in 2011 increased 44% from 2007. In the US, there are an estimated of 2.7 to 3.9 million people with chronic HCV infection and about 16,500 (7,200 – 43,400) new cases of HCV in 2011¹. Of those infected with HCV, 75%–85% will go on to

develop chronic infection and 15 – 25% will clear the virus ². HCV infection imposes a high economic burden ³. Resource implications of early detection and treatment of HCV infections could avert more than 120,000 HCV-related deaths, a strategy that is estimated to save \$1.5-7.1 billion in liver disease-related costs ⁴.

Hispanics are the largest minority in the USA and the rate of HCV among Hispanics increased by 21.4% in 2011 ¹. “Hispanic or Latino” refers to a person of Cuban, Mexican, Puerto Rican, South or Central American, or other Spanish culture or origin regardless of race ⁵. Chronic HCV in Hispanics is more aggressive and has a higher risk of developing cirrhosis than any other ethnic group or race ^{6,7}. Hispanics were more likely to be infected at a younger age, and are more likely to be co-infected with HIV ⁸, but were less likely to initiate treatment ⁹. They were less likely to be tested for HCV or referred to specialists than other ethnicities ¹⁰. Additionally, Hispanic injection drug users have a higher prevalence of HCV infection than other ethnicities ¹¹.

California has a large Hispanic population. It was estimated at 38.2% of the total state population ⁵. Of the 10 states that agree to publish their data on chronic HCV infection, California accounted for the largest percentage (57% of all reported chronic HCV cases in 10 states)¹. Hispanics in California are significantly more likely to be infected with hepatitis C (HCV) than Blacks or other ethnicities, and those Hispanics who have been infected have had their infection detected later ¹². In addition, they have been less likely to be linked to treatment due to reduced access to healthcare ^{12,13}. Late identification and reduced access to treatment of HCV among Hispanics are indicators of a health disparity.

Established risk factors for HCV infection include injection drug use, blood transfusions, solid organ transplant before 1992, use of coagulation factors before 1987, incarceration, vertical transmission, and multiple sex partners¹³⁻¹⁶. A more recently evaluated risk factor for HCV infections is tattooing. A study published by Carney in 2013, showed that tattoos are associated with HCV infection, even among those without traditional HCV risk factors such as IDU and blood transfusion prior to 1992 ¹⁷. Protective factors reported for HCV infection include income, education, and health insurance¹⁸. Some clinical evidence exists regarding the relationship between ethnicity, and other risk behavior, but only a handful of studies looked at these variables in combination with methadone use and HCV prevalence. One study in Australia demonstrated that independent correlation was found between HCV infection and imprisonment, tattooing, and methadone maintenance treatment (MMT) ¹⁹. In addition, another Australian study found that women on MMT were more commonly admitted to the hospital with HCV infection ²⁰. A Canadian study demonstrated that many individuals that enter MMT are already HCV positive, however harm reduction strategies can still reduce the transmission of blood-borne infections, namely HCV infection ^{21,22}. A study recently published from Israel showed that HCV sero-conversion was higher among HCV negative minorities ²³. In this manuscript, we will compare protective and risk factors associated with Hepatitis C infection among Hispanic with those of White-Non Hispanic individuals.

Methods

Study Participants

The data were collected from 1567 individuals (586 of Hispanic ethnicity, and 981 of White-Non Hispanic ethnicity) who were tested for antibodies to HCV from August 31, 2000 through December 22, 2013, and completed the Risk Behavior Assessment (RBA) at the Center for Behavioral Research and Services (CBRS) which is an HIV/STD testing site for Service Planning Area 8 (SouthBay) of Los Angeles County, CA. CBRS is located in a poverty area that has high illicit drug use. CBRS is a research center affiliated with California State University, Long Beach (CSULB).

Measures

The Risk Behavior Assessment (RBA) is an instrument that was originally developed by grantees funded by the National Institute on Drug Abuse (NIDA) in conjunction with NIDA Cooperative Agreement staff. This structured interview collects data on demographics, drug use, injection behavior, drug treatment, sexual behavior, sex trading, disease history, arrest and incarceration, and economic variables. The drug use questions included: ever used, age of first use, days used in the last 30 days, days injected in the last 30 days, time injected in the last 30 days, and days used without injecting in the last 30 days. The drugs listed included: alcohol, marijuana/hashish/ crack, cocaine by itself, heroin by itself, heroin and cocaine mixed together, nonprescription methadone, other opiates, amphetamines, and other drugs. There were also questions on drug treatment including methadone detoxification and methadone maintenance.²⁴ The 48-hour test-retest reliability of almost all variables and the validity of recent drug use self-report have been published (additional citations are available from the authors). The RBA was used to collect risk factor, demographic information, drug use, incarceration history, and history of sexually transmitted infections^{25,26}. Some of the respondents completed the Tattoo You-II Questionnaire, an instrument that was developed to collect information on tattoo and piercing practices of the respondents. No psychometric data have been reported for the Tattoo You II Questionnaire, however there is good face validity for the tattoo and piercing portions of the questionnaire. The Tattoo-You II is a second-generation, nine-question self-report instrument inquiring about the location and method of tattoos and body piercing, year of first and last tattoo/piercing, and materials relevant to cleaning and use of tattooing and piercing equipment, such as home-style tattoo guns²⁷. Informed consent was obtained using a form approved by the California State University, Long Beach Institutional Review Board and was administered by trained interviewers.

Statistical Methods

The analytic strategy followed general guidelines from Hosmer and Lemeshow²⁸. Because the research question was generally to compare Hispanics with HCV infection to Whites with HCV infection, included was a comparison in which HCV-positive Hispanics were compared to HCV-negative Hispanics and HCV-positive Whites were compared to HCV-negative Whites on bivariate tests of candidate variables. Factorial analyses of variance (ANOVA) with specific contrasts were used to assess the relationship between two categorical independent variables (race and HCV infection status) and normally distributed

dependent variables (age, jail time, number of days using cracks, marijuana, and illicit methadone). Breslow-Day tests were used to assess the homogeneity of the odds ratios of all categorical variables between two ethnicity groups²⁹. Following Hosmer and Lemeshow, those candidate variables that were significantly different between the two groups (for each ethnicity) were then considered for inclusion in separate multivariate logistic regression models to identify both risk and protective factors separately for Hispanics and Whites²⁸. Bivariate and logistic regression analysis was conducted using SAS 9.3.

Results

Almost half of our sample, both Hispanic and White-Non Hispanic descent, were HCV-infected. Almost half (43.9%; 257/586) of Hispanic respondents and 44.2% (434/981) of White-Non Hispanic respondents had a positive test result. The Hispanic sample was significantly younger, had a paid job, had longer jail time, and used illicit methadone more days than the White-Non Hispanic sample. The White-Non Hispanic sample was more likely to have ever used marijuana and to use it more days. They were more likely to have ever used crack, cocaine, heroin, and other opiates. The White-Non Hispanic sample was more likely to be homeless, to have given drugs or money to have sex, and to have given sex to get drugs. They were more likely to have ever had Hepatitis B infection and herpes than their Hispanic counterparts (Table 1).

The bivariate analysis results show that HCV-infected respondents, regardless of race, were significantly older and had longer jail time which was a particularly severe problem for HCV-infected Hispanics who spent significantly more time (Mean of 1000 days difference) incarcerated, than White-Non Hispanic HCV-infected respondents. The overall models and the interactions between race and HCV infection status with age and jail time were both significant (Table 2). Our study also found that homelessness and having had a paid job or salary were significantly associated with Hepatitis C infection status, where homeless respondents were more likely to have positive test results and respondents who had a paid job or salary were less likely to have negative results (Table 3). The income variable was only significantly associated with Hepatitis C infection among Hispanics. Respondents who gave drugs to have sex, regardless of their race, were more likely to have positive test results. Our study also found that respondents, who had a heterosexual sexual preference, regardless their race, were more likely to have positive test results. However, those differences were not significant across ethnicity (Table 3).

HCV-infected respondents, regardless their race, were more likely to share needles. The difference was significant across ethnicity in that the difference for Hispanics was significantly greater than the difference for Whites as indicated by the significant Breslow-Day test. The same is true for the use of crack, cocaine, heroin, heroin-cocaine mixed (speedball), illicit methadone, and other opiates. HCV-infected respondents of both ethnicities were more likely to have had an unprofessional tattoo. However the difference was not significant across ethnicities (Table 3).

Hispanic HCV-infected respondents were more likely to use crack more days, while White-Non Hispanic HCV-infected respondents were more likely to use marijuana fewer days than

their non HCV-infected counterparts. The overall models were significant and there is no significant interaction effect of race and HCV infection status (Table 3).

The bivariate results also show that Hispanics and Whites, who were HCV infected, were more likely to have been in methadone detoxification or methadone maintenance treatment, but the difference for Hispanics was significantly greater than for Whites. This is consistent with the multivariate results which show Hispanics being seven times more likely to have been in a prior methadone detoxification or maintenance program, while White-Non Hispanics were three times more likely to have been in a prior methadone detoxification or maintenance program (OR = 7.28 for Hispanic and OR = 3.42 for White-Non Hispanic). Both ethnic groups also show a significant association between current methadone maintenance treatment (in last 30 days) and HCV seropositivity, but there were no significant differences between the two groups. There were 204 individuals in our study who were currently receiving methadone maintenance treatment.

As for Sexually Transmitted Infections (STIs), Hispanics who had ever had genital warts or *Chlamydia* were less likely to have positive test results. Both STIs were protective factors for Hepatitis C infection among Hispanics. On the other hand, ever having had herpes was the sole protective factor among White-Non Hispanic participants, and White-Non Hispanics who had ever had gonorrhea or syphilis participants were also more likely to have positive HCV test results. The differences were significant across ethnicity, except for Hepatitis B, syphilis, and HIV (Table 3).

In a comparison of multivariate logistic regression models, Hispanics who were HCV infected were more likely to have used crack, heroin, and speedball. Hispanics who used crack were three times more likely to be HCV-infected (OR = 3.01). Those who used heroin were 7 times more likely to be HCV-infected, and those who used speedball were also seven times more likely to be HCV-infected (OR = 6.84, and 7.14 respectively). Among White-Non Hispanics, those who used heroin or speedball were 2 to 3 times more likely to be HCV-infected (OR = 3.01, and 2.07 respectively). They were more likely to be infected with syphilis (OR = 4.21), but were less likely to be infected with Herpes (OR = .34) than Hispanic HCV-infected individuals. In contrast, among Hispanics, those who were HCV positive were less likely to be infected with *Chlamydia* (OR = .42) and they were more likely to be infected with Herpes (OR = 5.39). White-Non Hispanic respondents who were HCV infected were more likely to identify as heterosexual rather than gay (OR = 5.75), and were more likely to be homeless (OR = 1.64). They were less likely to have a paid job or salary as their source of income (OR = .61), but were more likely to have given drugs to have sex (OR = 1.8). Those factors were not significantly associated with HCV infection among Hispanics (see Table 4).

Even though the bivariate results show that having an unprofessional tattoo was highly associated with HCV infection, this variable was not included in the model due to a large number of missing values.

Discussion

Percentages of those who were HCV-infected in our target population for both ethnic groups were much higher than the general population. In our study, the Hispanic sample showed that nearly half (44%) were HCV-infected compared with a prevalence of 6.3% among Hispanics in a study conducted in San Juan, Puerto Rico³⁰ and a quarter (26.7%) of a sample of homeless adults in downtown Los Angeles who were HCV-infected³¹.

As reported in previous literature, factors in the current study that were significantly associated with HCV infection for both Hispanic and White-Non Hispanic participants include: drug use, prior methadone detoxification or maintenance, and STIs. Drug use was a significant risk factor associated with HCV infection^{14,31-34}, particularly injected drugs^{8,15,35}. Use of heroin and speedball were significantly associated with HCV infection, but the risk is much higher among Hispanics than their White-Non Hispanics counterparts. Our study also found that Hispanic HCV-infected respondents were more likely to use crack. This risk factor was not significant among White-Non Hispanics. In addition, the Hispanic HCV infected subjects were also more likely to use illicit methadone and use it longer than their White-Non Hispanic counterparts¹¹.

HCV infected Hispanics were more likely to have prior methadone treatment and maintenance which is consistent with a previous study done in Australia³⁶. The issue of the seemingly counter-intuitive findings regarding methadone in the current study needs some elaboration. Even though others have shown that methadone “can reduce the transmission of blood-borne infections among individuals who inject opiates”³⁷ and adequate methadone has even been shown to be effective in prisons at reducing injection behavior³⁸, the current findings show apparent adverse effects of methadone. The current findings show an association with HCV seropositivity for both ever been in methadone maintenance in lifetime (both bivariate and multivariate) and recent or current methadone maintenance treatment. Our data do not include when the participants were infected with HCV in relation to the times of their various methadone treatment episodes. The individuals in our study may have been infected before they entered methadone treatment, during the time they were in methadone treatment, or after they left methadone treatment. What the current findings identify is the group of opiate users whose use was so severe that they sought treatment for it. This group has an urgent need for lifesaving HCV treatment, and methadone treatment programs are a very good setting for HCV case finding. This is especially true for the Hispanic population^{13,39}.

STIs were reported to be significant risk factors associated with HCV infection⁴⁰. Syphilis infection was a significant risk factor among White-Non Hispanics, while Herpes was the significant risk factor among Hispanics. However, not all STIs were associated with increased risk of acquiring HCV infection; our study reported that *Chlamydia* was a significant protective factor among Hispanics, while Herpes was a significant protective factor among White-Non Hispanics. The STI variables in our study reported both prior and current sexually transmitted infections.

In addition to those factors, among White-Non Hispanics, there were several additional significant risk/ protective factors including: homelessness, source of income, sex trading, and sexual preference. As reported in other studies, homelessness was a significant risk factor associated with HCV infection^{31,40}. Having a paid job or salary was a significant protective factor for HCV infection, while being heterosexual and giving drugs to have sex were significant risk factors that were associated with HCV infection. One of the surprising findings was that HCV-infected Hispanics spent a mean of 1000 days more incarcerated than HCV-infected Whites. This may reflect a difference in the seriousness of the crimes committed, a difference in access to legal defense resources, or a bias in sentencing.

Conclusion

Health disparities are preventable differences in the burden of disease, injury, violence, or opportunities to achieve optimal health that are experienced by socially disadvantaged populations⁴¹. Disparities are measured as the quantity that separates a group from a reference point on a particular measure of health that is expressed in terms of a rate, proportion, mean, or some other quantitative measure⁴².

Linkage to care and treatment is critical to reduce health disparities and to improve health outcomes for persons found to be infected with HCV. However, only 42% of HCV-infected drug users who were referred to treatment actually made an appointment and presented for treatment⁴³. Major advances in medical therapy used to treat HCV can provide virologic cure rates from 40%-80% which highlights the importance of identifying infected individuals and providing access to treatment. Linking patients to care and treatment is a critical component of the strategy to reduce the burden of disease and health disparities for Hispanics with HCV¹. Being in drug treatment is a good predictor of successful referral to HCV treatment⁴³. Although HCV is not efficiently transmitted sexually, persons at risk for infection through injection drug use might seek care in Sexually Transmitted Disease(STD) treatment facilities, HIV counseling and testing facilities, correctional facilities, drug treatment facilities, and other public health settings where STD and HIV prevention and control services are available. Therefore, in order to reduce or eliminate these health disparities, a comprehensive approach is required that includes case identification, clinical treatment, and community-based behavioral or structural interventions which can be applied to those infected with HCV⁴⁴.

Among Hispanic communities, our research findings confirm the importance of providing HCV testing linked to methadone treatment as well as for those with a history of incarceration, and to the importance of providing more information that explains prevention, detection, and treatment of HCV in both English and Spanish. A key aspect of the Affordable Care Act implementation will be to link HCV-infected Hispanics into treatment.

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Table 1

Sample Characteristics

	Hispanics <i>n</i> = 586	White-Non Hispanics <i>n</i> = 981	
Variable	% or Mean (SD)	% or Mean (SD)	<i>t</i> or χ^2 , <i>df</i>
Age in years	38.6 (10.9)	40.4 (10.6)	3.12 **, 1536
Jail time in days	1884.7 (2834.8)	1496.0 (2270.9)	-2.89 **, 1464
Marijuana use in 30 days	2.2 (6.7)	3.3 (8.1)	2.74 **, 1563
Illicit Methadone use in 30 days	2.1 (6.8)	.4 (1.9)	-3.06 **, 259
HCV positive	43.9	44.2	.02, 1
Male	68.0	67.2	.10, 1
Homeless	36.8	43.9	7.5 **, 1
Paid job, salary, business	24.1	17.35	10.46 **, 1
Income ^a :			
Less than \$500	60.8	61.7	15.12 ***, 1
\$500 - \$999	20.4	24.1	
\$1,000 - \$1,999	12.4	8.3	
More than \$2,000	6.4	5.9	
Sharing needles	11.4	11.8	.05, 1
Unprofessional tattoos ^b	40.2	43.1	.35, 1
Drug use:			
Marijuana	84	94	42.96 ***, 1
Crack	58.2	71.1	27.29 ***, 1
Cocaine	66.5	79.6	32.87 ***, 1
Heroin	55.5	63.1	8.99 **, 1
Heroin-Cocaine mixed	37.1	42	3.64, 1
Illicit Methadone	14.9	17.5	1.79, 1
Other opiates	33.3	49.1	36.99 ***, 1
Methadone detox - maintenance	25.4	24.2	.32, 1
Give drugs to have sex	17.4	22.9	6.68 **, 1

	Hispanics <i>n</i> = 586	White-Non Hispanics <i>n</i> = 981	
Variable	% or Mean (SD)	% or Mean (SD)	<i>t</i> or χ^2 , <i>df</i>
Give sex to get money	20.9	24.5	2.73, 1
Give money to have sex	15.2	21.8	10.14^{***} , 1
Give sex to get drugs	20.7	26.2	5.91[*] , 1
Sex preference:			
Heterosexual	67.6	73	18.62^{***} , 3
Gay	16.6	9.6	
Bisexual	13.2	15.6	
Other	2.6	1.7	
Ever had:			
HBV	9	13.2	6.29[*] , 1
Gonorrhea	14.3	16	.86, 1
Syphilis	6.5	5.2	1.11, 1
Genital warts	6	7.8	1.75, 1
Herpes	2.9	5.4	5.33[*] , 1
HIV infected	3.8	4.3	.25, 1
Chlamydia	13.4	13.2	.01, 1

Note:

*
 $p < .05$

**
 $p < .01$

 $p < .001$.

^a Wilcoxon signed rank sum test

^b has a smaller sample size, $n = 416$

Table 2

Bivariate Analysis for the Continuous Variables

	Hispanics			White-Non Hispanics			ANOVA	
	HCV Positive <i>n</i> = 257 Mean (SD)	HCV Negative <i>n</i> = 312 Mean (SD)	<i>t</i>	HCV Positive <i>n</i> = 434 Mean (SD)	HCV Negative <i>n</i> = 547 Mean (SD)	<i>t</i>	Overall model <i>F(df)</i>	Interactions <i>F(df)</i>
Age	44.5 (9.2)	33.8 (9.8)	-13.44 ^{***}	44.4 (8.8)	37.2 (10.8)	-11.23 ^{***}	103.49 (3, 1541) ^{**}	11.12 (1, 1541) ^{**}
Jail time in days	3579.9 (3346.7)	642.7 (1444.3)	-13.98 ^{***}	2498.9 (2684)	678.2 (1416.6)	-13.5 ^{***}	130.96 (3, 1470) ^{***}	20.84 (1, 1470) ^{***}
Crack use in 30 days	1.3 (4.9)	.49 (2.97)	-2.46 [*]	1.18 (4.45)	.76 (3.68)	-1.62	2.98 (3, 1570) [*]	.91 (1, 1570)
Marijuana use in 30 days	1.8 (6.0)	2.6 (7.2)	1.49	2.6 (7.1)	3.9 (8.6)	2.42 [*]	5.44 (3, 1569) ^{**}	.23 (1, 1569)
Illicit methadone use in 30 days	2.2 (6.9)	1.7 (6.9)	-.26	.2 (1.1)	.7 (2.8)	1.38	3.32 (3, 258) [*]	.47 (1, 258)
Weeks in methadone detoxification	40.7(78.7)	5.1(5.06)	-1.14	46.5(116.6)	14.6(30.7)	-2.02	1.8 (3, 325)	.01 (1, 325)
Weeks in methadone maintenance	183.5(206.9)	104(84.8)	-1.06	166.8(215.6)	158.4(265.4)	-.21	.46 (3, 290)	.69 (1, 290)

Note:

*
 $p < .05$

**

 $p < .01$

 $p < .001$.

Table 3

Bivariate Analysis for the Categorical Variables

	Hispanics			White-Non Hispanics			Breslow-Day Test	
	HCV Positive <i>n</i> = 257 %	HCV Negative <i>n</i> = 312 %	$\chi^2(1)$	HCV Positive <i>n</i> = 434 %	HCV Negative <i>n</i> = 547 %	$\chi^2(1)$	$\chi^2(1)$	
Homeless	43	32	7.4 ^{**}	52	37.5	20.45 ^{***}		.097
Paid job, salary, business	16	30.4	16.27 ^{***}	10.7	22.6	24.04 ^{***}		.014
Income								
Less than \$500	64.8	57.6	7.24 ^{**}	62.3	61.2	1.15		3.4
\$500 - \$999	23.2	18.1		27.4	21.5			
\$1,000 - \$1,999	9.6	14.7		5.9	10.3			
More than \$2,000	2.4	9.6		4.5	7.1			
Sharing needles	17.5	6.7	16.69 ^{***}	14.5	9.7	5.41 [*]		3.85 [*]
Unprofessional tattoo ^a	70	34.8	11.83 ^{***}	59.3	38.2	7.49 ^{**}		1.12
Drug use:								
Marijuana	88.3	80.2	6.94 ^{**}	95.1	93	1.88		.646
Crack	79	41.9	81.38 ^{***}	82.2	62.3	46.21 ^{***}		7.51 ^{**}
Cocaine	80.5	55.6	40.26 ^{***}	87	73.7	26.51 ^{***}		1.89
Heroin	91.8	27	245.1 ^{***}	85.4	45.5	165.05 ^{***}		25.22 ^{***}
Heroin-Cocaine mixed	72	9.8	239.13 ^{***}	63.4	25	145.97 ^{***}		35.33 ^{***}
Illicit methadone	26.5	5.8	48.61 ^{***}	24.8	11.7	28.59 ^{***}		7.62 ^{**}
Other opiates	49	21	50.8 ^{***}	57.3	42.6	20.88 ^{***}		10.21 ^{**}
Ever been in methadone maintenance in the last 30 days	23.64	2.05	68.03 ^{***}	16.06	2.84	54.74 ^{***}		2.73

	Hispanics				White-Non Hispanics				Breslow-Day Test	
	HCV Positive <i>n</i> = 257 %	HCV Negative <i>n</i> = 312 %	$\chi^2(1)$	HCV Positive <i>n</i> = 434 %	HCV Negative <i>n</i> = 547 %	$\chi^2(1)$	$\chi^2(1)$			
Ever been in methadone detox or maintenance	52.9	3.9	182.46 ^{***}	42.9	9.3	148.52 ^{***}	14.86 ^{***}			
Give drugs to have sex	21.9	14	6.23 [*]	28.8	18.3	14.9 ^{***}	.011			
Give sex to get money	24.2	18.3	3.05	23.7	25.2	.32	3.62			
Give money to have sex	16.9	13.8	1.01	22.5	21.2	.25	.314			
Give sex to get drugs	21.9	19.9	.35	23.3	28.5	3.45	3.16			
Sex pref.:										
Heterosexual	84	54.9	72.75 ^{***}	87.4	61.7	84.09 ^{***}	5.12			
Gay	3.5	26.8		2.8	15					
Bisexual	9	16.5		8.9	20.9					
Other	3.5	1.8		.9	2.4					
Ever had:										
HBV	14.6	4.6	17.61 ^{***}	23.4	5.2	69.33 ^{***}	1.27			
Gonorrhea	13.3	15	.36	19.9	12.9	8.9 ^{**}	4.56 [*]			
Syphilis	7	6.1	.2	7.2	3.7	5.96 [*]	1.18			
Genital warts	2.7	8.6	8.64 ^{**}	7.9	7.7	.01	6.37 [*]			
Herpes	3.5	2.4	.59	3.5	7	5.64 [*]	4.63 [*]			
HIV infected	1.9	5.2	4.16 [*]	4.2	4.4	.03	2.49			
Chlamydia	7	18.3	15.76 ^{***}	10.9	14.9	3.34	3.92 [*]			

Note:

* $p < .05$ ** $p < .01$ *** $p < .001$.

^d had a smaller sample size (Hispanics, $n = 184$, White-Non Hispanic, $n = 232$).

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Table 4

Logistic Regression

	Hispanic <i>n</i> = 573		White-Non Hispanic <i>n</i> = 959	
	OR	95% CI	OR	95% CI
Homelessness	1.32	.77 – 2.28	1.64	1.19 – 2.25
Needle Sharing	1.27	.60 – 2.74	1.14	.71 – 1.85
Had paid job, salary, or business	.76	.39 – 1.5	.61	.39 - .96
Ever used				
Crack	3.01	1.56 – 5.79	1.21	.81 – 1.83
Cocaine	.50	.24 – 1.03	1.05	.64 – 1.73
Heroin	6.84	3.36 – 13.9	3.01	1.93 – 4.69
Speedball	7.14	3.85 – 13.25	2.07	1.4 – 3.07
Other opiates	.64	.35 – 1.17	.52	.36 - .76
Give drugs to have sex	.94	.49 – 1.82	1.8	1.24 – 2.62
Bisexual vs. Gay	.69	.21 – 2.28	1.91	.82 – 4.44
Heterosexual vs. Gay	1.38	.5 – 3.78	5.75	2.69 – 12.28
Others vs. Gay	4.9	.77 – 31	3.17	.75 – 13.43
Ever been in methadone detox or maintenance	7.28	3.2 – 16.6	3.42	2.23 – 5.24
Ever had				
Gonorrhea	.64	.28 – 1.47	1.51	.96 – 2.37
Syphilis	1.98	.63 – 6.21	4.21	1.81 – 9.76
Herpes	5.39	1.3 – 22.32	.34	.16 - .73
Chlamydia	.42	.18 – .98	.63	.39 – 1.03
Hosmer and Lemeshow Goodness-of-Fit Test	$\chi^2(8) = 10.09, p = .26, \text{ROC} = .93$		$\chi^2(8) = 9.68, p = .28, \text{ROC} = .83$	