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Association of perceived and internalized stigma and nonfatal opioid overdose in rural Kentucky

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B.S., Harvey Mudd College, 2017

Faculty Thesis Advisor: Hannah Cooper, ScD

An abstract of

A thesis submitted to the Faculty of the
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Abstract

Association of perceived and internalized stigma and nonfatal opioid overdose in rural Kentucky

By Emma Klein

Drug-related stigma is theorized to be higher in rural areas, and stigma avoidance behaviors among people who use drugs may lead to an increased risk of overdose. Stigma has been associated with an increased risk of overdose in urban areas, but this relationship has not been studied in rural areas. In the context of epidemic drug overdose in rural areas, we aim to understand the association between perceived and internalized stigma and non-fatal overdose. A sample of 325 people who use drugs was recruited through respondent-driven sampling in rural counties in Kentucky. Stigma was measured with a 5-item scale measuring perceived and internalized stigma adapted from previous research. Overdose within the last 6 months was modeled with logistic regression. Of the 294 participants, 55 (16.9%) had experienced an overdose within the last six months. Both perceived stigma and internalized stigma were relatively high in the total study population, with over half (56.8%) reporting the highest level of perceived stigma and only 10.5% reporting no internalized stigma. Neither perceived nor internalized stigma was associated with overdose in the crude analysis (perceived OR=0.98 (95% CI 0.74, 1.31), internalized OR=1.36 (95% CI 0.51, 3.64)), or adjusted analysis (perceived aOR=1.13 (95% CI 0.80, 1.61), internalized aOR=1.07 (95% CI 0.31, 3.69). The null result may indicate measurement error, relatively low importance of perceived and internalized stigma in comparison to other stigma constructs, or a lack of association between stigma and overdose in the study population. Anti-stigma interventions may not be indicated for overdose prevention in rural areas, but remain important for other health outcomes.

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I would like to dedicate this thesis to Raunak Pednekar, who helped shape me into the thinker I am today, and who should have been here to talk me through the many methodological and ethical questions I had while putting this thesis together. I miss you.

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Introduction

In the United States, rural areas have been particularly hard-hit by the drug overdose crisis, with higher rates of opioid fatalities and a larger increase in opioid poisonings than metro counties (1, 2), though recent data indicates declines in rural counties (3). The rise in the non-medical use of prescription opioids has been disproportionately rural, with high opioid prescribing rates in rural areas and a rapid increase in drug overdose (4-6). In addition, many counties at highest risk for injection-associated outbreaks of HIV and Hepatitis C are rural (7). As opioid prescribing has declined in recent years, an increase in heroin and fentanyl use has caused a spike in overdose mortality nationwide. Between 1999 and 2016, small metro, micropolitan (nonmetro), and noncore (nonmetro) counties saw increases of 584%, 682%, and 721% in overdose fatalities respectively (1).

Stigma related to mental health and drug use is damaging to the health of people who use drugs (PWUD), and may be higher in rural areas (8, 9). Stigma, defined as the discrimination against and social exclusion of an individual as a result of some attribute, is a pervasive factor affecting the lives of PWUD. As first conceptualized by Goffman and later elaborated by Link and Phelan, stigma is the co-occurrence of five component phenomena: labeling, stereotyping, separation, status loss and discrimination, and power relations. Together, these five phenomena result in social exclusion and discrimination (10, 11). Previous work in urban areas has demonstrated a link between exposure to stigma or discrimination among PWUD and a variety of negative health outcomes. Stigma has been associated with poor mental health (12, 13), lack of access to health and social services (14-16), and risky injection practices (17, 18). Latkin et. al. showed an association between both enacted and internalized stigma and non-fatal overdose in Baltimore (19). The relationship of stigma to overdose is thought to be

mediated through the location of drug use, such as in public settings, or through the need to use quickly to avoid notice (20). Stigma's association with depression and poor mental health may also mediate the relationship, since these are in turn associated with drug overdose (21). Stigma of being labeled as a "problem drug user" may contribute to the under-utilization of medication treatment for opioid use disorder, especially for methadone (22), and use of these treatments has been associated with a reduction in opioid overdose mortality (23).

Though evidence indicates that stigma is higher in rural areas than in cities, few studies have explored the relationship between stigma and drug-related health outcomes in rural areas. Published research on drug-related stigma in rural areas tends to focus on stigma by community members toward harm-reduction interventions (24, 25). Other studies have focused on the overdose risk environment (26), social and geographic relationships between PWUD (27, 28), and infectious disease outcomes (29, 30). Research conducted on stigma in urban areas may not be generalizable to rural areas, because differences in social norms and social networks may change the character and effect of stigma in rural areas (8, 31). To our knowledge, this is the first study to examine the relationship of stigma and non-fatal overdose in a rural area.

In this study we characterize the associations between internalized and perceived stigma and self-reported non-fatal drug overdose in rural Kentucky. Perceived stigma here is defined as the expected beliefs about people who use drugs and the interpersonal consequences of said beliefs (16). In contrast, internalized stigma is the acceptance of negative public attitudes about one's own stigmatized group(s) and the internal and behavioral consequences thereof (32). We hypothesize that increased exposure to perceived and/or internalized stigma will increase the risk of non-fatal overdose in this population. A better understanding of the impact of stigma on non-fatal overdose will be

useful to better target interventions to prevent drug overdose, including naloxone training and distribution and targeted efforts to reduce stigma among healthcare workers, social service providers, and community members.

Methods

Study Design

Data in this study were collected from the baseline interview of the Gateway to Health (G2H) cohort, part of the ongoing Kentucky Communities and Researchers Engaging to Halt the Opioid Epidemic (CARE2HOPE) study. This project is a collaboration between researchers and community members to bring evidence-based interventions for reducing drug-related morbidity and mortality to 12 highly affected counties in rural Kentucky.

G2H used respondent-driven sampling (RDS) to recruit PWUD in five rural Kentucky counties to participate in the study. RDS is known to be an effective tool to recruit "hidden populations" and in large samples is roughly representative of the underlying population (33, 34) Eligibility criteria included being aged ≥18, residing in one of five Eastern Kentucky counties, and using opioids or injecting any drugs to get high in the past 30 days. Seeds for RDS came from a previous study of local PWUD that was designed to test internet-based recruitment (described elsewhere). Participants in that internet-based study were invited to serve as a seed in G2H if they agreed to be contacted for future research and if their network contacts placed them in the highest quartile of study participants, stratified by gender. Seeds were given coupon cards and received $10 for each additional participant they recruited, with a limit of three participants.

Surveys were administered by trained interviewers. Participants also completed rapid HIV, HCV, and syphilis testing following the interview. Participants received $25 for completing the survey and an additional $20 for the biological tests. The protocol was approved by the IRB at the University of Kentucky.

Measures

Stigma assessed with a 5-item scale adapted from Latkin et. al (35, 36). Each item had a four-point response option ranging from “not at all” to “very much.” The specific stigma questions and the domain (internalized or perceived stigma) that they measured can be found in Table 1.

In analyses of perceived and internalized stigma, perceived stigma was measured with a composite measure. The measure was constructed by adding the number of items in which the participant experienced no stigma. Thus, perceived stigma was measured with range 0-4, where zero indicates the highest stigma. Internalized stigma was measured using the single question “How much do you feel ashamed of using drugs,” and was coded as 1 for no stigma vs. 0 for any reported stigma to align with the measurement of perceived stigma. In analyses including each stigma item separately, each item was dichotomized at “very much” vs. any other response.

Participants were asked if they had ever experienced symptoms of an opioid overdose, described as “if you passed out, turned blue, or stopped breathing from using drugs.” If participants answered yes, they were then asked the date of their most recent overdose. Recent overdose was categorized as a binary variable in which 1 reflected one or more overdoses in the past 6 months, and 0 reflected no overdoses during that period.

Covariates were selected to represent standard demographic characteristics as well as established risk factors for opioid overdose. Demographic factors considered

were age, gender, income, education, homelessness, and recent incarceration. Drug-related risk factors included any injection in the past 6 months, frequency of injection, drugs used and drugs injected in the past 30 days, binge drinking in the past 30 days, snorting drugs in the past 30 days, total number of lifetime overdoses, drug selling, recent drug treatment, positive screen of opioid use disorder, owning naloxone, and exchanging syringes at the syringe service program.

Analysis

Given the definition of overdose in the survey, we restricted the sample to participants who reported using opioids in the past 6 months (N=294). The distributions of covariates were assessed in the total analytic sample as well as stratified by overdose status. Chi-square tests were used to test bivariate associations of covariates with overdose status and crude odds ratios were calculated.

Multivariate logistic regression was used to test the association between stigma and overdose. Two models were developed and tested. The first model contained the composite measures of perceived and internalized stigma. The second model contained each variable used in the stigma measures separately. Variables were retained in the multivariable model if they were associated with the outcome at $p<0.10$, if they were demographic characteristics, if they were identified a priori as theoretically important, or if they were one of our two focal predictors (internalized or perceived stigma). Selected covariates by statistical threshold included injection in the past 6 months, frequency of injection, total number of overdoses, heroin, fentanyl, methamphetamine, and speedball injection, drug selling, naloxone ownership, age, homelessness, and incarceration Additional demographics included gender, income and education, and theoretically important covariates were benzodiazepine use, binge drinking, opioid use disorder status. A supplementary analysis removed any of the above variables assumed to be on

the causal path from stigma to overdose. The removed variables were total number of overdoses, frequency of injection, alcohol use, opioid use disorder, and naloxone ownership. Multicollinearity was assessed, but determined to be of little importance. In the model with perceived and internalized stigma, VIFs for stigma were each around 1.2 in both crude and adjusted models. Model 2 VIFs were similar, ranging between 1.4 and 1.7 in the fully adjusted model.

Results

Sample Characteristics

The analytic sample consisted of 294 rural people who had used opioids within the past 6 months. The median age was 35 years (range 20-64), the sample was 55.8% male, and median monthly income was $500 (Table 2). About one-third (36.7%) of the sample experienced homelessness at some point in the last 6 months and 27.2% had been incarcerated in the last 6 months. Most participants (78.6%) had injected drugs in the past 6 months. Stigma was high in this population, with over half (56.8%) reporting the highest level of perceived stigma and only 10.5% reporting no internalized stigma. Of the stigma items, shame was the most commonly reported, with 58.2% reporting feeling "very much" ashamed. Worry about family rejection followed (49.7%), with comparatively low levels of stigma reported for the other items, around a quarter each. The most commonly injected drugs within the past 30 days were methamphetamine (58.8%), heroin (55.4%) and other (non-fentanyl) opioids (52.0%). Slightly more than half of participants (53.5%) reported injecting drugs at least once per day. Benzodiazepine use was also common (47.3%), as was binge drinking (34.7%). 18.7% of the sample reported overdose within the last 6 months. An additional 33.7% reported overdose longer than 6 months ago, and 47.6% reported never overdosing.

Bivariate Analysis

In a bivariate analysis, none of the items from the stigma scale had a significant association with past 6-month overdose. In addition, neither perceived nor internalized stigma was significantly associated with overdose. Covariates which had a significant positive association with overdose included homelessness, incarceration, injection in the past 6 months, frequency of injection, total number of overdoses, drug selling, and heroin, fentanyl, methamphetamine, and speedball injection. Crude odds ratios revealed no association between perceived or internalized stigma and opioid overdose in the past 6 months (perceived OR=0.98 (95% CI 0.74, 1.31), internalized OR=1.36 (95% CI 0.51, 3.64)), as seen in Table 2. When stigma measurements were decomposed into the component variables, there remained no significant results in crude analysis (Table 3).

Multivariable Analysis

In the adjusted analysis, the odds ratio for perceived stigma increased slightly compared to the unadjusted analysis and that for internalized stigma moved towards the null, but remained non-significant (perceived aOR=1.13 (95% CI 0.80, 1.61), internalized aOR=1.07 (95% CI 0.31, 3.69). Methamphetamine use (aOR=4.98 (1.41, 17.55)) and drug selling (aOR=2.61 (1.12, 6.12)) were the only covariates statistically significantly associated with opioid overdose. Sensitivity analysis results remained largely the same, though the odds ratio for internalized stigma became less than 1 (still non-significant), and though the odds ratio for drug selling was no longer significant.

When stigma measurements were decomposed, adjusted analysis was also largely similar to Model 1, though the variable measuring “how much do you feel people are uncomfortable around you” showed a significant negative association with drug overdose in the adjusted model (aOR=0.35 (0.12, 0.98)). None of the other stigma measurements showed a significant result. Both methamphetamine injection and drug selling remained

significant, as they did in the above model. Similar results were seen in the sensitivity analysis, though the relationship between the stigma measure and overdose was attenuated.

Discussion

In this population, neither internalized nor perceived stigma among people who use drugs is significantly associated with nonfatal opioid overdose. This contrasts with previous findings in urban areas, where stigma has been associated with overdose (19) and other harmful health outcomes such as infectious disease transmission via risky injection practices (18, 37). Instead, the strongest association observed in our sample was methamphetamine injection with opioid overdose, highlighting the syndemic of polydrug use in rural areas (38, 39). Variation in stigma was observed in our study population, reporting across the full range of perceived stigma and within each individual stigma question, however this variation was not associated with the outcome.

In our survey, we measured stigma using a 5-item scale where four items measured perceived stigma and one measured internalized stigma. This scale was adapted from a longer scale measuring stigma as a general construct; the source scale was not designed to assess internalized or perceived stigma. Though we have adapted it to this context, it is possible there is misclassification of either or both types of stigma due to the lack of validation of this measure. Likely, this misclassification is non-differential, biasing our results towards the null.

It is also possible that we *have* accurately measured internalized and perceived stigma, but other components of stigma are more important in this context. Internalized stigma is one subcomponent of the status loss and discrimination piece of the Link and Phelan stigma theory, while perceived stigma measures stereotyping (10). People who use drugs experience serious institutional discrimination, including in housing,

healthcare, employment, and criminal justice (40). It is possible that in this context these stigmatizing experiences are more important in the causal chain leading to overdose than internalized or perceived stigma.

In addition, emerging work on "intersectional stigma" suggests the importance of multidimensional and overlapping stigmas (41). In our sample, the high prevalence of homelessness and incarceration suggest intersectional stigma may be of interest, but was not measured. Our sample also includes people with diverse patterns of drug use, which may invoke different types of stigma. Our measurement only attempted to capture stigma related to drug use, and this single dimension may not fully capture the stigma landscape in which the study population lives.

Finally, it is possible that stigma is not an important driver of opioid overdose in this population. One of the possible mediators of the stigma – overdose relationship is access to opioid use disorder treatment services, since uptake of services appears to be lower among those with more internalized stigma (16). However, rural areas experience a critical shortage of OUD treatment, especially opioid substitution treatment, so lack of access may be uniform regardless of internalized stigma. Another possibility is the unique role of social networks in rural communities may buffer the effect of stigma. Two of the questions measuring perceived stigma ask directly about family and friends, though some evidence suggests that in rural communities, family and friends may be important to initiation of injection (42) or obtaining drugs (43). Thus, social ties may not be drivers of stigma in this setting.

This study has several strengths. First, we have a large sample of PWUD in rural Kentucky, an understudied population especially in the context of a rapidly changing drug use landscape. To our knowledge, this is the first large rural cohort with data collected after the influx of fentanyl and synthetic opioids into the US drug market.

One limitation of our study is reliance on self-reported overdose as an outcome. However, non-fatal overdose is underreported, and this measure can capture overdoses not reported to health authorities. It is possible self-reported overdose may be subject to differential misclassification, if higher levels of internalized stigma influence social desirability bias and lead to underreporting of overdose in this population. An additional limitation is the lack of a consistent time frame for much of the data. No time frame was specified for the stigma items, making it impossible to tell the temporal order of stigma and overdose. Overdoses were categorized for past 6 months, but the measures on drug use and drug injection only captured the past 30 days. Drug use patterns may be subject to change in this time period, leading to misclassification.

This research suggests that anti-stigma interventions for PWUD in rural areas may not be effective overdose prevention programming. Instead, focus should remain on proven harm-reduction interventions such as naloxone distribution, syringe service programs, and safer injection education, particularly geared towards polydrug use. As access to these services increase, monitoring stigma will continue to be of importance, if service engagement is indeed a mediator of the stigma-overdose relationship observed elsewhere. Additionally, it remains important to combat stigma as a fundamental cause of health inequity among PWUD (44).

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Tables

Table 1: Survey items measuring stigma

Stigma Question	**Domain**
How much do you feel people avoid you because you use drugs?	Perceived Stigma
How much do you fear you will lose your friends because you use drugs?	Perceived Stigma
How much do you feel fear family will reject you because you use drugs?	Perceived Stigma
How much do you think other people are uncomfortable being around you because you use drugs?	Perceived Stigma
How much do you feel ashamed of using drugs?	Internalized Stigma

Table 2: Description of analytic sample

	Total n=294		**Overdose, past 6 months n=55**		**No overdose, past 6 months n=239**		
	n or median	*% or IQR*	*n or median*	*% or IQR*	*n or median*	*% or IQR*	*p-value*
Perceived Stigma							0.3537
0	167	56.8%	29	53.7%	138	57.7%	
1	66	22.4%	16	29.6%	50	20.9%	
2-4	60	20.4%	9	16.7%	51	21.3%	
Internalized Stigma	31	10.5%	7	13.0%	24	10.0%	0.5285
Avoid	80	27.2%	16	29.6%	64	26.8%	0.671
Family	146	49.7%	29	53.7%	117	49.2%	0.5466
Friend	76	25.9%	12	22.2%	64	26.8%	0.4903
Uncomfortable	78	26.5%	12	22.2%	66	27.7%	0.4088
Shame	171	58.2%	30	55.6%	141	59.0%	0.6432
Age *(median-range)*	35	20-64	33	21-55	36	20-64	0.0568
Gender: Male	164	55.8%	36	65.5%	128	53.6%	0.2583
Monthly income > $1000	69	23.9%	13	24.1%	56	23.8%	0.9697
Education							0.8
Less than high school	92	31.4%	16	29.1%	76	31.9%	
High school	131	44.7%	24	43.6%	107	45.0%	
Greater than high school	70	23.9%	15	27.3%	55	23.1%	
Homeless past 6 months	108	36.7%	29	52.7%	79	33.1%	0.0064
Incarcerated past 6 months	80	27.2%	23	41.8%	57	23.9%	0.0069
Positive OUD screen	238		46	83.6%	192	80.3%	0.574
Drug treatment past 6 months	99	33.7%	15	27.3%	84	35.2%	0.2653
Main source of income selling drugs	55	18.7%	19	34.6%	36	15.1%	0.0008
Injected drugs past 6 months	231	78.6%	51	92.7%	180	75.3%	0.0045
Times overdosed	1	0-3	4	2-6	0	0-1	<0.0001
Daily or greater frequency of drug injection - past 30 days	157	53.4%	40	72.7%	117	49.0%	0.0014
Past 30-day drug injection							
Heroin	163	55.4%	40	72.7%	123	51.5%	0.0042
Fentanyl & analogs	64	21.8%	24	43.6%	40	16.7%	<.0001
Other opioid	153	52.0%	33	60.0%	120	50.2%	0.19
Cocaine	34	11.6%	9	16.4%	25	10.5%	0.2171
Methamphetamine	173	58.8%	47	85.5%	126	52.7%	<.0001
Speedball	32	10.9%	12	21.8%	20	8.4%	0.0039
Benzodiazapine use, past 30 days	139	47.3%	25	45.5%	114	47.7%	0.7637
Binge drinking, past 30 days	102	34.7%	17	30.9%	85	35.6%	0.5131
Snorted drugs, past 30 days	205	69.7%	40	72.7%	165	69.0%	0.59
Ever owned naloxone	55	18.7%	15	27.3%	40	16.7%	0.0708
Ever gotten syringes at SSP	130	44.2%	27	49.1%	103	43.1%	0.42

Table 3: Association between perceived and internalized stigma and opioid overdose (Model 1: Perceived and Internalized Stigma)

	Crude		**Adjusted**	
Variable	OR	95% CI	OR	95% CI
Perceived stigma	0.98	(0.74, 1.31)	1.13	(0.8, 1.61)
Internalized stigma	1.36	(0.51, 3.64)	1.07	(0.31, 3.69)
Injected drugs past 6 months	4.18	(1.45, 12.05)	2.38	(0.43, 13.28)
Daily injection	2.78	(1.46, 5.30)	0.65	(0.25, 1.69)
Total number of times OD			1.06	(0.99, 1.14)
Injected heroin past 30 days	2.51	(1.32, 4.80)	0.53	(0.19, 1.49)
Injected fentanyl past 30 days	3.85	(2.05, 7.25)	1.53	(0.59, 3.93)
Injected methamphetamine past 30 days*	5.27	(2.39, 11.63)	4.98	(1.41, 17.55)
Injected speedball past 30 days	3.06	(1.39, 6.71)	1.42	(0.5, 4.01)
Benzodiazepine use past 30 days	0.91	(0.51, 1.65)	0.63	(0.31, 1.31)
Binge drinking past 30 days	0.81	(0.43, 1.52)	0.90	(0.42, 1.9)
Positive OUD screen	1.25	(0.57, 2.74)	1.21	(0.43, 3.37)
Income from selling drugs*	2.98	(1.54, 5.75)	2.61	(1.12, 6.12)
Owned naloxone	1.87	(0.94, 3.70)	1.82	(0.78, 4.26)
Age 25-34 (ref: <25)	1.34	(0.74, 2.41)	0.78	(0.24, 2.54)
Age 35-44	0.97	(0.52, 1.80)	0.89	(0.27, 2.91)
Age 45+	0.37	(0.13, 1.07)	0.47	(0.09, 2.45)
Gender	0.61	(0.33, 1.13)	0.84	(0.39, 1.8)
Homeless past 6 months	2.26	(1.25, 4.09)	1.64	(0.77, 3.49)
Incarcerated past 6 months	2.30	(1.24, 4.24)	1.73	(0.82, 3.64)
Income > $1000 /month	1.01	(0.51, 2.03)	0.61	(0.24, 1.53)
HS Education (ref: <HS)	0.95	(0.52, 1.71)	0.64	(0.26, 1.55)
More than HS	1.25	(0.64, 2.43)	1.15	(0.42, 3.11)

Table 4: Association between stigma and opioid overdose (Model 2: All stigma components)

	Crude		Adjusted	
Variable	OR	95% CI	OR	95% CI
Avoid	1.56	(0.71, 3.45)	2.06	(0.77, 5.51)
Family	1.58	(0.79, 3.17)	1.16	(0.49, 2.73)
Friend	0.66	(0.3, 1.43)	0.63	(0.23, 1.68)
Uncomfortable*	0.56	(0.25, 1.29)	0.35	(0.12, 0.98)
Shame	0.78	(0.41, 1.51)	0.72	(0.31, 1.64)
Injected drugs past 6 months	4.18	(1.45, 12.05)	2.66	(0.48, 14.82)
Daily injection	2.78	(1.46, 5.30)	0.65	(0.24, 1.74)
Total number of times OD	-	-	1.08	(1, 1.16)
Injected heroin past 30 days	2.51	(1.32, 4.80)	0.49	(0.17, 1.46)
Injected fentanyl past 30 days	3.85	(2.05, 7.25)	1.66	(0.64, 4.31)
Injected methamphetamine past 30 days*	5.27	(2.39, 11.63)	5.28	(1.42, 19.64)
Injected speedball past 30 days	3.06	(1.39, 6.71)	1.32	(0.46, 3.82)
Benzodiazepine use past 30 days	0.91	(0.51, 1.65)	0.70	(0.33, 1.48)
Binge drinking past 30 days	0.81	(0.43, 1.52)	0.90	(0.41, 1.97)
Positive OUD screen	1.25	(0.57, 2.74)	1.27	(0.45, 3.58)
Income from selling drugs*	2.98	(1.54, 5.75)	2.98	(1.21, 7.34)
Owned naloxone	1.87	(0.94, 3.70)	1.71	(0.71, 4.12)
Age 25-34 (ref: <25)	1.34	(0.74, 2.41)	0.75	(0.23, 2.48)
Age 35-44	0.97	(0.52, 1.80)	0.95	(0.28, 3.16)
Age 45+	0.37	(0.13, 1.07)	0.51	(0.09, 2.72)
Gender	0.61	(0.33, 1.13)	0.94	(0.42, 2.1)
Homeless past 6 months	2.26	(1.25, 4.09)	1.43	(0.65, 3.14)
Incarcerated past 6 months	2.30	(1.24, 4.24)	1.97	(0.9, 4.28)
Income > $1000 /month	1.01	(0.51, 2.03)	0.58	(0.22, 1.52)
HS Education (ref: <HS)	0.95	(0.52, 1.71)	0.56	(0.23, 1.41)
More than HS	1.25	(0.64, 2.43)	1.04	(0.37, 2.92)