

# No Door to Lock

## Victimization Among Homeless and Marginally Housed Persons

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**Background:** Homeless persons experience high rates of sexual and physical assault; homeless women are thought to be at highest risk. To determine the prevalence, distribution, and factors associated with sexual and physical assault, we surveyed homeless and marginally housed adults in San Francisco, Calif.

**Methods:** We interviewed 2577 respondents about their history of recent sexual and physical assault, housing history, sexual practices, substance use, health status, and criminal justice history. The main outcome measures were self-reported sexual and physical assault in the previous 12 months.

**Results:** Overall, 32.3% of women, 27.1% of men, and 38.1% of transgendered persons reported a history of either sexual or physical assault in the previous year; 9.4% of women, 1.4% of men, and 11.9% of transgendered per-

sons reported sexual assault, and 30.6% of women, 26.6% of men, and 33.3% of transgendered persons reported physical assault. In multivariate models, being homeless (as opposed to marginally housed) was associated with sexual assault for women, but not for men (adjusted odds ratio for homeless women, 3.4 [1.2-9.7]). Housing status was not associated with physical assault for women or men. Mental illness and sex work were both common and associated with high rates of assault in multivariate analyses.

**Conclusions:** Sexual and physical assault are common experiences for homeless and marginally housed persons. Housing is associated with lower rates of sexual assault among women. Strategies to decrease sexual and physical assault and its consequences are needed in this population.

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**H**OMELESS PERSONS report high rates of sexual and physical abuse.<sup>1-6</sup> A history of victimization is associated with the initiation and prolongation of homelessness.<sup>7</sup> A variety of factors appear to place homeless persons at high risk of victimization: lack of protective shelter,<sup>3,8,9</sup> proximity to high-crime areas, engagement in high-risk activities (such as sex work),<sup>10,11</sup> history of previous victimization,<sup>12</sup> mental illness,<sup>7,13,14</sup> and substance abuse.<sup>7,15,16</sup>

Sexual and physical assaults have numerous consequences for homeless persons. Injuries caused by assault are important antecedents to use of health care,<sup>17,18</sup> particularly the emergency department. A history of victimization is associated with high utilization of emergency departments,<sup>19</sup> poorer self-rated health,<sup>2</sup> and mental health problems, including depression, suicide attempts, and posttraumatic stress disorder.<sup>7,20,21</sup> Among

homeless young adults, homicides are a frequent cause of death and contribute to the excess death.<sup>22,23</sup>

Research on victimization among homeless women<sup>2,17,24</sup> suggests a high risk of sexual assault. There is little research on sexual and physical victimization among homeless men. This study examines factors associated with physical and sexual victimization among homeless and marginally housed women and men. The study includes both the "true" homeless (those who have recently lived, at least part of the time, on the streets or in homeless shelters) and marginally housed adults (ie, those who live in low-cost hotels). We hypothesized that adults who are marginally housed will have lower rates of past-year sexual and physical assault than those living in the streets or in homeless shelters. In addition, we were interested in characterizing the association of mental illness, sex work, and drug use with victimization.

## METHODS

### SAMPLING DESIGN

The study's target population was homeless and marginally housed adults in the city and county of San Francisco, Calif. We collected the sample by using Burnam and Koegel's<sup>25</sup> method for obtaining a replicable, representative sample of the urban indigent by recruiting subjects at sites of service provision. We extended Burnam and Koegel's methods to include a stratum of persons recruited from low-income hotels.<sup>25</sup> During a 21-month period starting in April 1996, we surveyed 2577 English-speaking adults from all 7 overnight shelters in San Francisco (50 adults per night minimum) and 5 of 6 midday free-meal programs (100 adults at least 3 days per week minimum) and from 26 of 83 eligible low-income residential hotels selected randomly proportionate to size. Residential hotels located in low-income San Francisco neighborhoods that rented rooms for less than \$400 per month were eligible.

The University of California, San Francisco, Committee on Human Research approved the study.

Recruited individuals were invited to participate in a interview conducted at or near each sampling site. No names or other personal identifying information were recorded; a unique study identification code was created for each respondent all related materials. Respondents received incentives of either \$10 cash (for shelter or meal program recruits) or \$15 cash (for hotel recruits). No significant gender or racial-ethnic differences were observed between participants and nonparticipants.

### INSTRUMENTATION

Trained interviewers conducted a structured interview. We assessed characteristics including age, racial-ethnic self-identification, education, marital or partner status, and income from all sources in the previous 30 days. Most of the questions were developed during our group's previous studies on the homeless.<sup>26-29</sup> Biological sex was attributed by interviewers; where interviewers were unsure, they asked, "What was your sex at birth?" Respondents were also asked to report their gender as men, women, or transgender. Those who reported themselves as transgendered and those who reported their biological sex as being different from their apparent gender were determined to be transgendered. Where self-reported gender disagreed with the sex as determined by the interviewer, we accepted subjects' self-reports. We calculated rates of assault by using the categories men, women, or transgendered. Chronic homelessness was defined as 1 year or more of accumulated time homeless as an adult. Current health status was rated on a 5-point scale dichotomized into "fair or poor" health and "excellent, very good, or good" health.

### Victimization

Sexual assault was assessed with a positive response to, "In the past 12 months, did anyone force you to have sex with them?" Physical assault was assessed with a positive response to either, "In the past 12 months, were you physically attacked or assaulted?" or "Was anything taken from you by force?" Theft was assessed with an affirmative response to, "In the past 12 months, did anyone steal any of your property?"

### Housing Status

Using a 12-month follow-back calendar with important dates as a guide, respondents identified types of places where they spent the night in the previous 12 months and the number of nights spent in each type of place. To distinguish between those

who spent occasional nights in hotels and those who lived there, we defined being "marginally housed" as spending at least 90% of nights in a hotel, apartment, or private home and no nights on the street or in a shelter. Anyone who had fewer than 90% of nights in a hotel and had spent at least 1 night in a street or shelter was designated as homeless. Those who did not meet either criterion were excluded.

### Recent Sexual Behavior

Respondents reported the number and biological sex of their sexual partners (anal, oral, or vaginal) in the previous 12 months. Recent sexual behavior (in the previous 12 months) was dichotomized into exclusively heterosexual partners or any same-sex partners. Recent sex work included either having been paid for sex or given drugs in exchange for sex during the previous 12 months.

### Substance Use, Mental Health, and Criminal Justice System Involvement

We asked whether the respondent "thought that he or she had an alcohol problem in the past 12 months." We asked about recent (12-month) use of illegal drugs, including crack, other cocaine, heroin, opiates not prescribed for the respondent, or stimulants (including "speed," "crank," amphetamines, crystal methamphetamine, or "ice") or self-report of a "drug problem." Lifetime hospitalization for treatment of a psychiatric or emotional problem was used as a proxy for mental health problems. We asked respondents if they had been arrested in the past year or had ever been imprisoned.

For further details on the sampling strategy and interview methods, see Kushel et al<sup>19</sup> and Robertson et al.<sup>30</sup>

### STATISTICAL ANALYSIS

We tested for bivariate associations by means of Wilcoxon rank sum test for ordinal terms and the  $\chi^2$  test for categorical terms. We constructed separate multivariate models for sexual assault, physical assault, and any assault. Because of the low numbers of transgendered respondents, such respondents were excluded from the bivariate and multivariate analyses. Candidate variables for multivariate analyses were chosen on the basis of previous hypotheses and significance of  $P \leq .10$  in univariate analyses. We conducted a forward stepwise selection model and retained covariates with a  $P \leq .05$  in the model. We tested for interactions between key variables and included interactions significant at the  $P \leq .05$  level. We assessed for multicollinearity by means of Pearson correlation coefficients, and we validated final models with the Hosmer-Lemeshow test.

## RESULTS

We interviewed 2577 subjects (67% of those approached). Of these, 35.1% were recruited for the study at a shelter, 23.6% at a food line, and 41.3% at a single-room occupancy hotel. Overall, 48.1% of respondents reported spending the night before the study in a residential hotel.

### SUBJECT CHARACTERISTICS

Three quarters of subjects were men (76.0%), nearly one quarter (22.3%) were women, and 42 persons (1.6%) were classified as transgendered (**Table 1**). Respondents reported their race-ethnicity as white (39.0%), African American (44.2%), Latino (5.3%), Asian (1.5%), Pacific Islander (3.0%), Native American (2.7%), and other

**Table 1. Demographic Characteristics of Subjects Stratified by Gender and Housing Status\***

	No. of Subjects (%)	Women, %	Men, % (P)	Homeless, %	Marginally Housed, % (P)
Overall	2535 (100.0)	22.7	77.3	77.0	23.0
Race/ethnicity					
White	988 (39.0)	39.3	39.0 (.17)	39.1	38.4 (.24)
African American	1121 (44.2)	43.4	44.6	43.9	45.3
Latino	134 (5.3)	4.0	5.7	5.7	3.8
Other†	292 (11.5)	13.3	10.7	11.2	12.5
Age, y (n = 2490)					
<20	12 (0.5)	0.4	0.5 (<.001)	0.6	0.2 (<.001)
20-44	1419 (57.0)	65.6	54.6	60.7	44.4
≥45	1059 (42.5)	34.1	44.9	38.7	55.4
Education					
<High school	669 (26.4)	29.9	25.2 (.04)	27.1	24.2 (.36)
High school	947 (37.4)	32.5	37.4	36.8	39.1
>High school	919 (36.3)	37.6	37.4	36.1	36.7
Median monthly income, \$	500	480	500 (.28)	476	630 (<.001)
Currently married or live with partner	370 (14.6)	28.0	10.7 (<.001)	14.2	15.8 (.36)
Housing status					
Homeless	1952 (77.0)	78.2	76.5 (.42)	NA	NA
Marginally housed	583 (23.0)	21.9	23.5	NA	NA
>90% time on street	264 (10.4)	7.9	11.2 (.02)	13.5	NA
>50% time indoors	1993 (78.6)	84.3	77.0 (<.001)	72.2	NA
Ever homeless ≥1 y	1006 (39.7)	33.7	41.6 (<.001)	44.8	22.6 (<.001)
Sexual orientation (n = 2467)					
Heterosexual	1824 (73.9)	73.3	74.0 (.74)	74.2	73.2 (.65)
Same-sex partner or bisexual	643 (26.1)	26.7	26.0	25.9	26.8
Sexual partners (n = 2489)					
<5	2038 (81.9)	87.3	80.3 (<.001)	79.9	88.4 (<.001)
≥5	451 (18.1)	12.7	19.7	20.1	11.6
Sex work	263 (10.4)	15.6	8.9 (<.001)	11.5	6.7 (<.001)
Substance use (past year)					
Alcohol problem	583 (23.0)	18.5	24.4 (.003)	24.2	18.9 (.007)
Any illegal drug use‡	1455 (57.4)	54.4	58.4 (.09)	59.7	49.7 (<.001)
Crack use (n = 2404)	1075 (44.7)	45.4	44.5 (.71)	46.9	37.5 (<.001)
Injection drug use	587 (23.2)	23.4	23.3 (.93)	22.4	25.6 (.12)
Mental illness					
History of psychiatric hospitalization	557 (22.0)	24.0	21.4 (.19)	22.4	20.6 (.36)
Criminal justice					
Arrested in past year	732 (28.9)	25.4	29.9 (.03)	32.8	15.6 (<.001)
Prison (ever)	567 (22.4)	13.5	25.0 (<.001)	23.1	19.9 (.10)
Fair or poor health	868 (34.2)	42.3	32.0 (<.001)	32.9	38.8 (.009)
Dependent variables (past year)					
Sexual assault	82 (3.2)	9.4	1.4 (<.001)	3.7	1.7 (.02)
Physical assault	699 (27.6)	30.6	26.6 (.06)	29.3	22.0 (<.001)
Physical or sexual assault	718 (28.3)	32.3	27.1 (.01)	30.1	22.5 (<.001)
Theft	1257 (49.6)	50.2	49.5 (.77)	54.3	34.0 (<.001)

Abbreviation: NA, not applicable.

\*Forty-two transgendered persons were excluded from this analysis.

†Includes Asian, Pacific Islander, Native American, and "other" ethnicity.

‡Illegal drug use includes self-reported drug problem in past year, any injection or noninjection use of heroin, cocaine, crack, other opiate, or stimulants in past year.

(4.3%). Respondents ranged in age from 18 to 77 years; the mean age was 43 years. Most were single. One quarter had minor children, but few lived with them. Forty percent of respondents experienced chronic homelessness, having accumulated at least 1 year of homelessness since age 18 years. Three quarters of respondents (73.6%) had at least a high school education. A third (34.2%) reported their health as fair or poor. A history of psychiatric hospitalization (22.0%), alcohol problems (23.0%), illegal drug use (57.4%), and arrests in the past year (28.9%) were common (Table 1).

## HOUSING

A quarter of respondents (23.0%) were categorized as marginally housed. Most other respondents spent at least part of each month staying in residential hotels, but moved frequently between indoor and outdoor settings. Few of the homeless respondents (9.9% of women and 14.6% of men) spent more than 90% of their nights outdoors in unsheltered settings. Three quarters of the homeless respondents spent at least half of their nights indoors, in a hotel, shelter, or hospital or doubled up with friends or family.

## SEXUAL BEHAVIORS

Three quarters of respondents had been sexually active in the previous 12 months; one quarter of men and women reported having had sex with at least 1 person of the same gender. Among women, only 5.2% reported having exclusively women as sexual partners. Most men (72.3%) who reported sex with men also reported sex with women. In addition, 15.6% of women and 8.9% of men reported sex work in the previous 12 months.

### MENTAL ILLNESS, SUBSTANCE ABUSE, AND CRIMINAL JUSTICE INVOLVEMENT

Of those interviewed, 18.5% of women and 24.4% of men described themselves as having had an alcohol problem in the past year. More than half of the respondents (57.4%) reported having used an illegal drug in the past year, with crack and heroin being the most common. Almost a quarter of respondents (22.0%) reported a lifetime history of psychiatric hospitalization; 6.0% reported a psychiatric hospitalization in the past year. Significantly more men than women reported a lifetime history of being in prison (25.0% vs 13.5%); arrests in the past year were common in both genders, with 29.9% of men and 25.4% of women reporting at least 1 arrest.

### VICTIMIZATION

One third of women (32.3%), 27.1% of men, and 38.1% of transgendered persons reported either sexual or physical victimization in the previous year. Sexual assault in the past year was reported by 9.4% of women, 1.4% of men, and 11.9% of transgendered persons; 30.6% of women, 26.6% of men, and 33.3% of transgendered persons had been physically assaulted. Half of all respondents reported having been robbed in the past year (Table 1 and **Table 2**).

Marginally housed men and women reported significantly less victimization than those who were homeless ( $P < .01$  for all comparisons except for sexual assault comparison,  $P = .02$ ). Homeless sex workers and homeless persons with mental illness reported extremely high rates of assault. Among homeless sex workers, 20.6% of women and 5.3% of men reported sexual assault and 49.3% of women and 43.3% of men reported physical assault. Among homeless persons with mental illness, 20.9% of women and 2.2% of men reported having been sexually assaulted, and 49.1% of women and 39.5% of men reported physical assault.

### SEXUAL ASSAULT: BIVARIATE AND MULTIVARIATE RESULTS

In a multivariate model (**Table 3**), there was a marginally significant association between being homeless, as opposed to marginally housed, and sexual assault (adjusted odds ratio [AOR], 2.0; 95% confidence interval [CI], 1.0-4.2;  $P = .06$ ). In a model that included an interaction term for housing status and gender, there was a significant interaction; among women, housing status was strongly associated with sexual assault (AOR for home-

**Table 2. Victimization Among 42 Transgendered Persons\***

Victimization	No. (%)
Sexual assault	5 (11.9)
Physical assault	14 (33.3)
Sexual and/or physical assault	16 (38.1)
Theft	22 (52.4)

\*Transgendered persons were defined as subjects who reported their sex as transgendered ( $n = 40$ ) and subjects who reported their sex at birth as different from their current sex ( $n = 2$ ).

less women vs marginally housed women, 3.4 [95% CI, 1.2-9.7];  $P$  for interaction  $< .01$ ). For men, there was no association between housing status and sexual assault (AOR for homeless men vs marginally housed men, 1.1 [95% CI, 0.4-3.0]). Other factors that were associated with sexual assault included poor health (both history of psychiatric hospitalization [AOR, 2.1; 95% CI, 1.3-3.5] and fair or poor health [AOR, 1.7; 95% CI, 1.1-2.8]), and sexual behaviors (same-sex partners, AOR, 2.0; 95% CI, 1.2-3.4) and sex work (AOR, 2.6; 95% CI, 1.5-4.4). Age and gender were associated with sexual assault. Younger age was associated with higher rates (AOR for 10-year decrease in age, 1.3; 95% CI, 1.0-1.8;  $P = .03$ ), as was being a woman (AOR, 6.2; 95% CI, 3.7-10.1).

Factors significant in bivariate but not multivariate analysis included African American race (lower odds), more than 5 sexual partners in the past year, chronic homelessness, previous arrests, alcohol and other drug use, and low educational attainment (Table 3).

### BIVARIATE AND MULTIVARIATE RESULTS: PHYSICAL ASSAULT

In contrast to sexual assault, men were as likely as women to report incidents of physical assault. The multivariate model predicting physical assault was dominated by substance abuse, illegal activities, and poor health. Significant factors included a perceived alcohol problem (AOR, 1.8; 95% CI, 1.4-2.2), use of illegal drugs (AOR, 1.3; 95% CI, 1.1-1.6), sex work (AOR, 1.9; 95% CI, 1.4-2.5), a history of arrest (AOR, 1.7; 95% CI, 1.4-2.1), psychiatric hospitalization (AOR, 1.8; 95% CI, 1.4-2.2), and fair or poor health (AOR, 1.3; 95% CI, 1.1-1.6). African Americans were at lower risk (AOR, 0.6; 95% CI, 0.5-0.7) than whites. Younger persons were at higher risk (AOR for 10-year age decrease, 1.2; 95% CI, 1.0-1.3) ( $P < .01$ ). Housing status was significant in the bivariate model, but not after adjustment (**Table 4**).

For both models, we explored the result of classifying transgendered persons as women, because of the similarity in rates of victimization. This did not change the results significantly.

### COMMENT

In this community-based study of homeless and marginally housed persons, we found rates of sexual and physical assault that were markedly higher than in the general population. Rates among transgendered persons were even higher than those for women. We found that among

**Table 3. Sexual Assault in the Past Year: Bivariate and Multivariate Results\***

Characteristic	Bivariate						Multivariate†	
	Women			Men			AOR (95% CI)	P Value
	%	OR (95% CI)	P Value	%	OR (95% CI)	P Value		
Gender	9.4	7.1 (4.5-11.4)‡	<.001	1.4	Referent		<b>6.2 (3.7-10.1)</b>	<b>&lt;.001</b>
Race/ethnicity								
White non-Latino	10.2	Referent		1.5	Referent		NS	
African American	5.7	0.5 (0.3-1.0)‡	<.001	1.4	1.0 (0.4-2.2)	.78		
Latino	13.0	1.3 (0.4-4.8)	.68	2.7	1.9 (0.5-6.9)	.22		
Other	18.4	2.0 (1.0-4.1)§	.03	1.0	0.7 (0.1-3.0)	.41		
Age, y								
Mean (range)		38.3 (19-61)			39.7 (25-70)			
10-y Decrease		1.4 (1.1-2.0)§	.02		1.5 (1.0-2.2)‡	.04	<b>1.3 (1.0-1.8)</b>	<b>.03</b>
Sexual orientation								
Heterosexual	7.4	Referent		0.7	Referent			
Sex with same-sex partner/bisexual	14.9	2.2 (1.2-3.9)§	.009	3.4	5.0 (2.3-11.0)‡	<.001	<b>2.0 (1.2-3.4)</b>	<b>.005</b>
≥5 Partners in past year	21.1	3.5 (1.8-6.7)‡	<.001	2.7	2.4 (1.1-5.4)	.03	NS	
Housing status¶								
Homeless	11.2	3.8 (1.3-10.8)§	.01	1.5	1.1 (0.5-2.8)	.80	2.0 (1.0-4.2)	.06
Marginally housed	3.2	Referent		1.3	Referent		Referent	
Homeless >1 y#	16.6	3.2 (1.8-5.7)‡	<.001	2.4	3.0 (1.4-6.7)‡	.007	NS	
Psychiatric hospitalization (lifetime)	19.0	3.4 (1.9-6.0)‡	<.001	1.9	1.5 (0.6-3.4)	.35	<b>2.1 (1.3-3.5)</b>	<b>.002</b>
Alcohol problem	15.1	2.0 (1.1-3.7)§	.03	2.1	1.7 (0.8-3.8)	.12	NS	
Illegal drug use**	11.6	1.8 (1.0-3.2)	.06	1.7	1.5 (0.7-3.4)	.31	NS	
Sex work	18.0	2.6 (1.4-4.8)‡	.004	4.6	4.3 (1.8-9.8)‡	<.001	<b>2.6 (1.5-4.4)</b>	<b>&lt;.001</b>
Arrested in past year	14.5	2.0 (1.1-3.6)§	.02	2.4	2.4 (1.1-5.0)§	.02	NS	
Education								
<High school	7.6	0.7 (0.4-1.4)	.33	2.4	2.3 (1.1-4.8)§	.04	NS	
≥High school	10.2	Referent		1.1	Referent			
Fair or poor health††	10.7	1.3 (0.7-2.3)	.36	2.2	2.1 (1.0-4.5)§	.04	<b>1.7 (1.1-2.8)</b>	<b>.03</b>

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; NS, not included in the model; OR, odds ratio.

\*N = 2520. Analyses exclude 42 transgendered persons and 15 subjects with missing information. Significant factors are indicated by boldface type.

†Multivariate model adjusted for gender, age, sexual orientation, homeless vs marginally housed, lifetime psychiatric hospitalization, sex work, and health status.

‡P ≤ .01.

§P ≤ .05.

¶Referent is 4 or fewer sexual partners.

¶¶In a model that included the interaction term for homeless or marginally housed and gender, the AOR for homeless women vs marginally housed women was 3.4 (1.2-9.7) and the interaction was significant at P < .01. The AOR for homeless men vs marginally housed men was 1.1 (0.4-3.0).

#Not included in multivariate model because of collinearity with the covariate "homeless" (Pearson correlation coefficient, 0.19).

\*\*Illegal drug use includes self-reported drug problem in past year and any injection or noninjection use of heroin, cocaine, crack, other opiate, or stimulants in past year.

††Referent is good, very good, or excellent health.

women, those who were homeless experienced more sexual victimization than those who lived mostly in hotels (the marginally housed). There was no such difference among men. In examining the factors associated with sexual and physical assault, we found strong associations between mental illness, poor health, and sex work and both sexual and physical victimization, and between substance use and physical victimization. These findings highlight the role that victimization plays in the web of disabilities faced by homeless persons.

As in previous studies, we found far higher rates of both sexual and physical assault than in the general population.<sup>1,4,31</sup> For women, we found an annual rate of approximately 10% as compared with rates ranging from 2.5 per 1000 to 5% per year in nonhomeless women.<sup>32,33</sup> Most data on sexual assault in the general population are lifetime rates, estimates of which range from 13% to 25%.<sup>17,33,34</sup> Among men, the difference was even greater; in the general population, annual rates are estimated at 0.3 per 1000.<sup>16,32</sup> The rates of sexual assault among men

in our study were higher than most estimates among women in the general population. Rates of physical assault in our study were also much higher than population norms.<sup>17,35</sup> Because assault is more common in younger persons, the scarcity of subjects younger than 20 years in our study makes our findings more striking and suggests that homelessness eliminates age-related protections against physical assault.<sup>17,33</sup>

Previous work has suggested that homeless women experience higher rates of victimization than low-income housed women.<sup>3,8</sup> Our findings agree with this. To our knowledge, the issue has not previously been studied among homeless men. We found no difference between homeless and marginally housed men with respect to sexual assault. We did not have information on whether sexual assault was perpetuated by strangers or persons known to the victims and where the assault took place: this topic merits further study. Women may have more to gain in terms of protection from sexual victimization by being housed.

**Table 4. Physical Assault in the Past Year: Bivariate and Multivariate Results\***

Characteristic	Bivariate						Multivariate	
	Women			Men			AOR (95% CI)	P Value
	%	OR (95% CI)	P Value	%	OR (95% CI)	P Value		
Gender	30.6	1.2 (1.0-1.5)	.06	26.6	Referent		1.1 (0.9-1.4)	.30
Race/ethnicity								
White non-Latino	33.3	Referent		33.4	Referent		Referent	
African American	23.8	0.6 (0.4-0.9)‡	.005	21.5	0.5 (0.4-0.7)‡	.008	<b>0.6 (0.5-0.7)</b>	<.001
Latino	34.8	1.1 (0.4-2.6)	.86	27.0	0.7 (0.5-1.2)	.75	0.7 (0.4-1.0)	.30
Other	43.4	1.5 (0.9-2.6)	.046	23.0	0.6 (0.4-0.8)‡	.009	1.0 (0.7-1.3)	.06
Age, y								
Mean (range)		39.3 (19-65)			42.2 (19-71)			
10-y Decrease		1.4 (1.1-1.6)‡	.001		1.3 (1.1-1.4)‡	<.001	<b>1.2 (1.0-1.3)</b>	<b>.004</b>
Sexual orientation								
Heterosexual	27.3	Referent		24.6	Referent		NS	
Sex with same-sex partner/bisexual	39.2	1.7 (1.2-2.6)‡	.007	32.8	1.5 (1.2-1.9)‡	<.001		
≥5 Partners in past year§	53.5	3.1 (1.8-5.1)‡	<.001	37.0	1.9 (1.5-2.4)‡	<.001	NS	
Housing status								
Homeless	33.1	1.8 (1.1-2.9)	.01	28.1	1.4 (1.1-1.8)‡	.009	1.2 (0.9-1.5)	.25
Marginally housed	21.6	Referent		21.9	Referent		Referent	
Homeless > 1 y	37.3	1.6 (1.1-2.3)	.01	31.1	1.5 (1.2-1.8)‡	<.001	NS	
Psychiatric hospitalization (lifetime)	48.2	2.8 (1.9-4.1)‡	<.001	37.0	1.9 (1.5-2.4)‡	<.001	<b>1.8 (1.4-2.2)</b>	<.001
Alcohol problem	40.6	1.7 (1.1-2.7)	.01	39.5	2.3 (1.8-2.8)‡	<.001	<b>1.8 (1.4-2.2)</b>	<.001
Illegal drug use¶	38.6	2.4 (1.6-3.4)‡	<.001	30.7	1.7 (1.4-2.1)‡	<.001	<b>1.3 (1.1-1.6)</b>	<b>.008</b>
Sex work	49.4	2.6 (1.7-4.2)‡	<.001	42.8	2.2 (1.6-3.1)‡	<.001	<b>1.9 (1.4-2.5)</b>	<.001
Arrested in past year	45.5	2.4 (1.6-3.6)‡	<.001	36.7	2.0 (1.6-2.5)‡	<.001	<b>1.7 (1.4-2.1)</b>	<.001
Education								
<High school	29.8	1.0 (0.6-1.4)	.80	23.6	0.8 (0.6-1.0)	.08	NS	
≥High school	30.9	Referent		27.7	Referent			
Fair or poor health#	33.1	1.2 (0.9-1.7)	.27	31.3	1.4 (1.1-1.7)‡	.002	<b>1.3 (1.1-1.6)</b>	<b>.003</b>

Abbreviations: AOR, adjusted odds ratio; CI, confidence interval; NS, not included in model; OR, odds ratio.

\*N = 2520. Analyses exclude 42 transgendered persons and 15 subjects with missing information. Significant factors are indicated by boldface type.

†Multivariate model adjusted for gender, ethnicity, age, homeless vs marginally housed, lifetime psychiatric hospitalization, alcohol problem, illegal drug use, sex work, and health status.

‡P < .01.

§Referent is 4 or fewer sexual partners.

||P ≤ .05.

¶Illegal drug use includes self-reported drug problem in past year and any injection or noninjection use of heroin, cocaine, crack, other opiate, or stimulants in past year.

#Referent is good, very good, or excellent health.

In our study, previous psychiatric hospitalization, used as a proxy for mental illness, was associated with both sexual and physical victimization. Previous research has suggested that mental illness among homeless persons may be both cause and effect: it may represent the consequence of previous victimization and may be a cause of increased vulnerability to victimization.<sup>7</sup> Mental illness may compromise persons' ability to identify and avoid signals of danger.<sup>13,14</sup> Substance abuse is thought to be a risk factor for perpetration of violence, and those who use illegal substances are more likely to be around others who do the same, increasing their vulnerability to violence.<sup>15,36,37</sup> We did not find that alcohol or other drug use was associated with sexual assault. However, both were associated with physical assault. Studies in nonhomeless populations have associated alcohol<sup>20,36,38</sup> and other drug<sup>15,33</sup> use with both sexual and physical assault, although the direction of the relationship is unclear; alcohol and substance use may be consequences of previous victimization.<sup>17</sup>

Sex work was common; we found a strong association between sex work and assault. Although research on sex work is scant in the medical literature,<sup>39,40</sup> exist-

ing research does suggest high rates of sexual<sup>41</sup> and physical<sup>10,42</sup> victimization. Health care providers should question homeless persons about their involvement in sex work; sex work is associated with numerous health problems,<sup>43,44</sup> including victimization.

Our study has several important limitations. All data were self-reported; we cannot rule out recall bias. Because the questionnaires were administered in English, we may have underestimated the proportions of Latino and Asian homeless and marginally housed persons. Comparing rates of sexual and physical assault with community norms is complicated by the difficulty of establishing accurate rates in the community. Criminal justice system data are unreliable because of low rates of reporting to police,<sup>32</sup> lack of uniform definitions of assault between surveys,<sup>17</sup> and use of different time frames.

The cross-sectional design of our study might lead to the oversampling of chronically homeless persons, who may have higher rates of victimization.<sup>45</sup> Because there is a positive relationship between sexual assault and length of time homeless,<sup>7</sup> our study may overestimate the true

rate of assault in this population. On the other hand, our inclusion of a relatively stably housed marginally housed population may bias estimates downward. Prevalence estimates for sexual and physical assault may be influenced by the number and nature of questions asked. For example, using multiple behaviorally specific questions is associated with higher rates of reporting of sexual assault.<sup>17</sup>

Our study did not include information on previous victimization, an important potential confounder that is common in homeless populations.<sup>31</sup> Adult survivors of childhood sexual abuse are thought to be at high risk for future sexual abuse.<sup>46-49</sup> Social disruptions that accompany childhood sexual and physical assault may contribute to adult homelessness as well as future victimization. History of assault as an adult increases the risk of a future assault.<sup>33</sup> The high rates of victimization we found may be partially explainable by high rates of previous victimization, and previous victimization may confound some of the associations. Finally, we do not know whether the perpetrators were intimate partners of the subjects who reported assault because we did not ask who the assailants were.

Homeless persons are among the most vulnerable people in our society, lacking the stability and protection that housing affords. Violence and victimization among indigent adults are common but serious problems that need to be addressed along with the other challenges facing this population. We must improve our understanding of the ways in which these factors interact and design interventions that allow homeless persons to regain the safety of home.

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## REFERENCES

1. Wenzel SL, Koegel P, Gelberg L. Antecedents of physical and sexual victimization among homeless women: a comparison to homeless men. *Am J Community Psychol.* 2000;28:367-390.
2. Wenzel SL, Leake BD, Gelberg L. Health of homeless women with recent experience of rape. *J Gen Intern Med.* 2000;15:265-268.
3. Nyamathi AM, Leake B, Gelberg L. Sheltered versus nonsheltered homeless women differences in health, behavior, victimization, and utilization of care. *J Gen Intern Med.* 2000;15:565-572.
4. Kipke MD, Simon TR, Montgomery SB, Unger JB, Iversen EF. Homeless youth and their exposure to and involvement in violence while living on the streets. *J Adolesc Health.* 1997;20:360-367.
5. Linn LS, Gelberg L, Leake B. Substance abuse and mental health status of homeless and domiciled low-income users of a medical clinic. *Hosp Community Psychiatry.* 1990;41:306-310.
6. North CS, Smith EM, Spitznagel EL. Violence and the homeless: an epidemiologic study of victimization and aggression. *J Trauma Stress.* 1994;7:95-110.
7. Lam JA, Rosenheck R. The effect of victimization on clinical outcomes of homeless persons with serious mental illness. *Psychiatr Serv.* 1998;49:678-683.
8. Link B, Phelan J, Bresnahan M, Stueve A, Moore R, Susser E. Lifetime and five-year prevalence of homelessness in the United States: new evidence on an old debate. *Am J Orthopsychiatry.* 1995;65:347-354.
9. Burt M, Aron L, Lee E. *Helping America's Homeless: Emergency Shelter or Affordable Housing?* Washington, DC: Urban Institute Press; 2001.
10. Church S, Henderson M, Barnard M, Hart G. Violence by clients towards female prostitutes in different work settings: questionnaire survey. *BMJ.* 2001;322:524-525.
11. El-Bassel N, Simoni JM, Cooper DK, Gilbert L, Schilling RF. Sex trading and psychological distress among women on methadone. *Psychol Addict Behav.* 2001;15:177-184.
12. Noell J, Rohde P, Seeley J, Ochs L. Childhood sexual abuse, adolescent sexual coercion and sexually transmitted infection acquisition among homeless female adolescents. *Child Abuse Negl.* 2001;25:137-148.
13. Coverdale JH, Turbott SH. Sexual and physical abuse of chronically ill psychiatric outpatients compared with a matched sample of medical outpatients. *J Nerv Ment Dis.* 2000;188:440-445.
14. Gearon JS, Bellack AS. Women with schizophrenia and co-occurring substance use disorders: an increased risk for violent victimization and HIV. *Community Ment Health J.* 1999;35:401-419.
15. Siegal HA, Falck RS, Wang J, Carlson RG. Crack-cocaine users as victims of physical attack. *J Natl Med Assoc.* 2000;92:76-82.
16. Kilpatrick DG, Acierno R, Resnick HS, Saunders BE, Best CL. A 2-year longitudinal analysis of the relationships between violent assault and substance use in women. *J Consult Clin Psychol.* 1997;65:834-847.
17. Crowell N, Burgess A. *Understanding Violence Against Women.* Washington, DC: National Research Council; 1996.
18. Koss MP, Koss PG, Woodruff WJ. Deleterious effects of criminal victimization on women's health and medical utilization. *Arch Intern Med.* 1991;151:342-347.
19. Kushel MB, Perry S, Bangsberg D, Clark R, Moss AR. Emergency department use among the homeless and marginally housed: results from a community-based study. *Am J Public Health.* 2002;92:778-784.
20. Burnam MA, Stein JA, Golding JM, et al. Sexual assault and mental disorders in a community population. *J Consult Clin Psychol.* 1988;56:843-850.
21. Kilpatrick DG, Best CL, Veronen LJ, Amick AE, Villeponteaux LA, Ruff GA. Mental health correlates of criminal victimization: a random community survey. *J Consult Clin Psychol.* 1985;53:866-873.
22. Hwang SW, Orav EJ, O'Connell JJ, Lebow JM, Brennan TA. Causes of death in homeless adults in Boston. *Ann Intern Med.* 1997;126:625-628.
23. Hwang SW. Mortality among men using homeless shelters in Toronto, Ontario. *JAMA.* 2000;283:2152-2157.
24. Weinreb L, Goldberg R, Perloff J. Health characteristics and medical service use patterns of sheltered homeless and low-income housed mothers. *J Gen Intern Med.* 1998;13:389-397.
25. Burnam MA, Koegel P. Methodology for obtaining a representative sample of homeless persons: the Los Angeles Skid Row Study. *Eval Rev.* 1988;12:117-152.
26. Zolopa AR, Hahn JA, Gorter R, et al. HIV and tuberculosis infection in San Francisco's homeless adults: prevalence and risk factors in a representative sample. *JAMA.* 1994;272:455-461.
27. Pilote L, Tulsky JP, Zolopa AR, Hahn JA, Schechter GF, Moss AR. Tuberculosis prophylaxis in the homeless: a trial to improve adherence to referral. *Arch Intern Med.* 1996;156:161-165.
28. Robertson MJ, Zlotnick C, Westerfelt A. Drug use disorders and treatment contact among homeless adults in Alameda County, California. *Am J Public Health.* 1997;87:221-228.
29. Robertson MJ, Cousineau MR. Health status and access to health services among the urban homeless. *Am J Public Health.* 1986;76:561-563.
30. Robertson MJ, Clark R, Charlebois ED, et al. HIV seroprevalence among homeless and marginally housed adults in San Francisco. *Am J Public Health.* In press.
31. Burt M, Aron L, Douglas T, et al. *Homelessness: Programs and the People They Serve: Findings From the National Survey of Homeless Assistance Providers and Clients, Technical Report.* Washington, DC: US Dept of Housing and Urban Development's Office of Policy Development and Research; 1999.
32. *Criminal Victimization in the United States, 1997 Statistical Tables.* Washington, DC: Bureau of Justice Statistics; 2000. NCJ 174446.

33. Acierno R, Resnick H, Kilpatrick DG, Saunders B, Best CL. Risk factors for rape, physical assault, and posttraumatic stress disorder in women: examination of differential multivariate relationships. *J Anxiety Disord.* 1999;13:541-563.
34. Sorenson SB, Stein JA, Siegel JM, Golding JM, Burnam MA. The prevalence of adult sexual assault: the Los Angeles Epidemiologic Catchment Area Project. *Am J Epidemiol.* 1987;126:1154-1164.
35. Fingerhut LA, Ingram DD, Feldman JJ. Homicide rates among US teenagers and young adults: differences by mechanism, level of urbanization, race, and sex, 1987 through 1995. *JAMA.* 1998;280:423-427.
36. Abbey A, Zawacki T, Buck PO, Clinton AM, McAuslan P. Alcohol and sexual assault. *Alcohol Res Health.* 2001;25:43-51.
37. Ullman SE, Brecklin LR. Alcohol and adult sexual assault in a national sample of women. *J Subst Abuse.* 2000;11:405-420.
38. Ullman SE, Karabatsos G, Koss MP. Alcohol and sexual assault in a national sample of college women. *J Interpersonal Violence.* 1999;14:603-625.
39. Kilbourne AM, Herndon B, Andersen RM, Wenzel SL, Gelberg L. Psychiatric symptoms, health services, and HIV risk factors among homeless women. *J Health Care Poor Underserved.* 2002;13:49-65.
40. Greene JM, Ennett ST, Ringwalt CL. Prevalence and correlates of survival sex among runaway and homeless youth. *Am J Public Health.* 1999;89:1406-1409.
41. El-Bassel N, Schilling RF, Irwin KL, et al. Sex trading and psychological distress among women recruited from the streets of Harlem. *Am J Public Health.* 1997; 87:66-70.
42. El-Bassel N, Schilling RF, Gilbert L, Faruque S, Irwin KL, Edlin BR. Sex trading and psychological distress in a street-based sample of low-income urban men. *J Psychoactive Drugs.* 2000;32:259-267.
43. Alexander P. Sex work and health: a question of safety in the workplace. *J Am Med Womens Assoc.* 1998;53:77-82.
44. El-Bassel N, Witte SS, Wada T, Gilbert L, Wallace J. Correlates of partner violence among female street-based sex workers: substance abuse, history of childhood abuse, and HIV risks. *AIDS Patient Care STDS.* 2001;15:41-51.
45. Phelan JC, Link BG. Who are "the homeless"? reconsidering the stability and composition of the homeless population. *Am J Public Health.* 1999;89:1334-1338.
46. Cloitre M, Tardiff K, Marzuk PM, Leon AC, Portera L. Childhood abuse and subsequent sexual assault among female inpatients. *J Trauma Stress.* 1996;9:473-482.
47. Nelson EC, Heath AC, Madden PA, et al. Association between self-reported childhood sexual abuse and adverse psychosocial outcomes: results from a twin study. *Arch Gen Psychiatry.* 2002;59:139-145.
48. Coid J, Petrukevitch A, Feder G, Chung W, Richardson J, Moorey S. Relation between childhood sexual and physical abuse and risk of revictimisation in women: a cross-sectional survey. *Lancet.* 2001;358:450-454.
49. Goodman LA, Fallot RD. HIV risk-behavior in poor urban women with serious mental disorders: association with childhood physical and sexual abuse. *Am J Orthopsychiatry.* 1998;68:73-83.

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