ORIGINAL ARTICLE

Crime Victimization in Adults With Severe Mental Illness

Comparison With the National Crime Victimization Survey

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Context: Since deinstitutionalization, most persons with severe mental illness (SMI) now live in the community, where they are at great risk for crime victimization.

Objectives: To determine the prevalence and incidence of crime victimization among persons with SMI by sex, race/ethnicity, and age, and to compare rates with general population data (the National Crime Victimization Survey), controlling for income and demographic differences between the samples.

Design: Epidemiologic study of persons in treatment. Independent master's-level clinical research interviewers administered the National Crime Victimization Survey to randomly selected patients sampled from 16 randomly selected mental health agencies.

Setting: Sixteen agencies providing outpatient, day, and residential treatment to persons with SMI in Chicago, Ill.

Participants: Randomly selected, stratified sample of 936 patients aged 18 or older (483 men, 453 women) who were African American (n=329), non-Hispanic white (n=321), Hispanic (n=270), or other race/ethnicity (n=22). The comparison group comprised 32 449 participants in the National Crime Victimization Survey.

Main Outcome Measure: National Crime Victimization Survey, developed by the Bureau of Justice Statistics.

Results: More than one quarter of persons with SMI had been victims of a violent crime in the past year, a rate more than 11 times higher than the general population rates even after controlling for demographic differences between the 2 samples ($P<.001$). The annual incidence of violent crime in the SMI sample (168.2 incidents per 1000 persons) is more than 4 times higher than the general population rates (39.9 incidents per 1000 persons) ($P<.001$). Depending on the type of violent crime (rape/sexual assault, robbery, assault, and their subcategories), prevalence was 6 to 23 times greater among persons with SMI than among the general population.

Conclusions: Crime victimization is a major public health problem among persons with SMI who are treated in the community. We recommend directions for future research, propose modifications in public policy, and suggest how the mental health system can respond to reduce victimization and its consequences.

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PRIOR STUDIES[1-6] SUGGEST that crime victimization is common among persons with mental disorders who live in the community. Like other vulnerable populations (eg, homeless persons, persons with developmental disabilities, and public housing residents[7-9]), persons with severe mental illness (SMI) are a particularly high-risk group. Symptoms associated with SMI, such as impaired reality testing, disorganized thought processes, impulsivity, and poor planning and problem solving, can compromise one's ability to perceive risks and protect oneself.[2,3,10-13] Moreover, factors correlated with victimization—substance abuse, conflicted social relationships, poverty, and homelessness[14-17]—are common among persons with SMI.[2,5,18]

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Since deinstitutionalization, most persons with SMI now live in the community rather than in hospitals or residential facilities.[19,20] The number of patients enrolled in 24-hour hospital and residential services has decreased from 471 451 in 1969 (237 per 100 000 persons with SMI) to 215 798 in 1998 (80 per 100 000

persons with SMI).[21] Mean length of stay has decreased to less than 10 days.[22] Trends toward shorter and less frequent hospitalization are likely to continue as providers rely increasingly on nonresidential care and managed care to reduce costs.[21,22] Deinstitutionalization may also have increased homelessness,[19,23] a key risk factor for victimization[24]; one quarter to one third of homeless persons have mental illness.[25,26]

Despite recent federal initiatives addressing victimization among persons with mental disorder,[27,28] there are few empirical studies. Moreover, no study has examined recent crime victimization in persons with SMI as the Bureau of Justice Statistics (Washington, DC) does for the general population, which is by annual incidence rates (number of incidents per 1000 persons per year). Instead, studies examine only prevalence of crime victimization.

Prevalence varies widely[1,2,4-6,29-36] (from 15% to nearly 60%) because of differences in recall periods (2 months[5] to 3 years[4]), definitions of victimization, and samples (summary table available on our Web site, http://www.psycho-legal.northwestern.edu). For example, Silver[5] found that 15.2% of 270 acute psychiatric inpatients had been hit, forced to have sex, or threatened or attacked with a weapon within the preceding 10 weeks. Brekke et al[4] found that 38% of 172 outpatient clients with schizophrenia had been victimized within the preceding 3 years; 91% of the incidents were violent. Like the studies by Silver[5] and Brekke et al,[4] most studies investigated specific subgroups of persons with mental disorders: homeless persons,[33,34] board and care residents,[6,29] or involuntarily admitted psychiatric inpatients later committed to outpatient treatment.[1,2]

Despite their value, the prior studies have limitations:

1. Measurement: Few investigations collected comprehensive data on recent crime victimization. Many of the larger studies[31-33,36] reported only global categories of a few types of crimes (eg, "any sexual assault," "any physical assault"). Others[1,2,5,6,29] relied on only 3 or 4 general questions about crime, for example, "In the last 4 months, have you been a victim of a violent crime?"[1,2]

2. Samples: Most prior samples were too small to analyze less prevalent crimes (eg, robbery, rape, sexual assault) and how key demographic characteristics (sex, race/ethnicity, and age) relate to violent victimization.[4,30,32,33,35]

3. Comparisons with the general population: No study has statistically compared recent crime victimization with general population data collected by the National Crime Victimization Survey (NCVS) for the Bureau of Justice Statistics.

To our knowledge, this is the first large-scale epidemiologic study of prevalence, incidence, and patterns of victimization among persons with SMI and how they compare with general population rates. The Northwestern Victimization Project (Northwestern University, Chicago, Ill) has 2 key features: (1) a large, random sample of persons with SMI living in the community and (2) the same instrument to measure victimization as the Bureau of Justice Statistics (the NCVS). In this article, we compare prevalence and incidence rates with general population estimates computed from the NCVS data, controlling for demographic differences between the samples.

METHODS

SAMPLING

We drew a multisite, stratified, probability sample of 936 clients of agencies providing psychiatric services to persons with SMI in Chicago. Data were collected between January 31, 1997, and October 4, 1999. Sampling was conducted in 2 stages.

We randomly selected 16 sites from a comprehensive list of 75 agencies that provided outpatient, day, and residential treatment. The probability of a site's selection was proportional to the numbers of patients treated at that site. Fifteen sites agreed to participate; the site that refused prohibited outside researchers. We sampled an additional site to replace it.

Participants were randomly selected from the 16 sites. To ensure adequate numbers in key subgroups, we stratified by sex, race/ethnicity, and age using demographic data reported by the Illinois Office of Mental Health (Springfield). All reported estimates were weighted to reflect the population of persons treated in Chicago.

PROCEDURES

Interviewers were master's-level clinicians experienced with adults with chronic and severe mental illnesses. Interviewers randomly selected potential participants from waiting rooms and day rooms (outpatient and day programs) or from client lists (residential programs), systematically filling stratification requirements for sex, race/ethnicity, and age.

Northwestern University's institutional review board approved the protocol and consent form. To obtain consent, interviewers approached potential participants and identified themselves as researchers from Northwestern University. They described the study and explained that participation was confidential and would not affect the participants' living situation or mental health treatment. Interviewers reviewed the consent form with each client and explained that participants could refuse to answer any question and could withdraw from the study at any time. Participants were paid $15 in cash at the end of the interview. Interviews were conducted in private areas at each facility, lasted 2 to 4 hours, and were administered in Spanish by bilingual/bicultural interviewers if the participants so requested (20.4%; n=199). All participants were administered an interview with a 12-month recall period. We maintained consistency throughout the study by monitoring scripted interviews with mock participants; item agreement exceeded 90% for all instruments.

PARTICIPANTS

Six of the sites treated only persons with SMI; at these sites, all clients were eligible. At the other 10 sites (which treated any mental disorder), persons were eligible to participate only if they answered yes to 1 of the following questions: (1) "Have you taken psychiatric medications for the past 2 years?" or (2) "Have you ever been hospitalized for psychiatric reasons?" We did not recruit clients arriving for their first visits or who were receiving crisis management services.

Of 1782 clients selected, 458 (25.7%) refused to participate. There were no significant differences in refusal rates by age. Significantly more women (28.7%) than men (22.1%) refused to participate. Significantly more Hispanic persons (33.2%) refused to participate than non-Hispanic white persons (22.3%) and African American persons (21.8%). These differences appear to be because 1 site, an outpatient clinic located in a large hospital with many Hispanic and female clients, had a high rate of "no-shows." We reanalyzed refusal rates after omitting this

site from the calculation; we found no significant differences by sex or race/ethnicity.

There were 155 clients (8.7%) who were not interviewed because they could not provide informed consent: 59 spoke neither English nor Spanish and 96 were too symptomatic to participate. Another 142 persons (8.0%) agreed to participate but did not keep their appointments (n = 129) or terminated their interviews (n = 13). Twenty-two participants were unable to provide reliable information because they either failed the cognitive impairment section of the Composite International Diagnostic Interview[37] (CIDI) version 2.1 (see "Instruments" subsection which follows; n = 13) or had psychotic symptoms that prevented them from completing the interview (n = 9).

The number of participants who completed the interview was 1005, drawn from day treatment (30.9%), residential treatment (13.5%), and outpatient (55.6%) programs. Among these 1005 participants, 936 (93.1%) met criteria for psychosis or major affective disorder. The other 69 participants (6.9%) included 6 persons who had dementia or a mental disorder caused by a physical disorder, 36 persons who had anxiety disorders, behavioral disorders, substance use disorders, adjustment disorder, or sexual dysfunction, and 27 persons who were missing diagnosis records and did not meet diagnostic criteria on the 12-month CIDI. Because we focus on persons with SMI, we present here only data on the 936 participants who had psychosis or major affective disorder. Analyses of the entire sample (n = 1005), substantially similar to those presented here, are available on our Web site.

The final sample size of 936 allows us to detect victimization rates reliably (ie, distinguish them from 0) when the base rate in the general population is 1.0% or greater with a power of 0.8. The mean ± SD age in the sample was 42.4 ± 10.6 years (median = 42 years); 51.6% were men and 48.4% were women. The racial/ethnic characteristics of the sample were African American (35.3%), Hispanic (28.8%), non-Hispanic white (34.3%), and other (1.6%). The mean ± SD monthly income of the participants was $625 ± $447 (median = $556; 95th percentile = $1340).

INSTRUMENTS

The CIDI version 2.1, which provides *DSM-IV* and *International Classification of Diseases, 10th Revision* diagnoses and comprehensive information on symptoms, was administered. The CIDI has several advantages: it is widely used in epidemiologic research, it is automated for computer administration, and it relies on objective data. Diagnosis records, although sometimes incomplete, were needed to supplement the 12-month CIDI, which does not score a diagnosis unless the participant has been symptomatic within the past year.

The NCVS instruments[38] were also administered. Because only half of violent crimes and even fewer nonviolent crimes are reported to police,[39] self-report studies such as the NCVS are used to study crime victimization.[40-43] The NCVS, an annual study of approximately 43 000 households comprising nearly 80 000 persons,[44-46] is conducted by the Bureau of the Census on behalf of the Department of Justice (Washington, DC). The NCVS instruments have several strengths: they allow us to compare our data with general population data, they are the most comprehensive instruments available to assess victimization, and they have been extensively tested.

The NCVS has 2 parts:

1. The Basic Screen is a brief instrument eliciting demographic information and identifying the number and types of possible victimizations to explore. For example, the screen asks respondents (specifying the recall period): "Has something belonging to you been stolen?" or "Have you been attacked or threatened?"

2. The Crime Incident Report then elicits detailed information on each event. These detailed data allow the researcher to determine whether each event is a crime, what kind of crime, where it occurred, who was involved, if the victim resisted, if the police were notified, the extent of property loss, the degree of physical injury, and so on. Because the NCVS is designed for use in the general population, we simplified the wording and reordered portions of the survey to fit the needs of our sample and to avoid redundancy.

TESTING FOR RECALL BIAS

General population studies find that participants sometimes report incidents that occurred prior to the requested recall period, a problem called "telescoping."[47-52] Telescoping may inflate estimates of crime. To reduce this bias, the NCVS first interviews participants with a "bounding interview" that serves only as a reference point for recalling events; although participants are asked about their prior victimizations, these data are not used for analysis. In subsequent bounded interviews, respondents are asked, "Since the last interview, have you been . . . ?" Reported incidents are then checked to make sure they had not already been reported in the preceding (bounding) interview.

Although bounded interviews reduce the likelihood of telescoping, they are expensive; to our knowledge, no study of persons with SMI used bounded interviews. To check the effect of telescoping yet still reduce costs, we administered bounded interviews (with a 6-month recall period) to a randomly selected subsample. To obtain the subsample, we randomly selected 302 persons from the original sample and reinterviewed 264 (87.4%) of them at a location of their choice. Data from the unbounded (n = 936) and bounded (n = 264) interviews were used to compare estimates of victimization across the 2 samples.

We found that unbounded interviews produced lower estimates of victimization than did bounded interviews. (Analyses available from us.) Recall bias (not remembering events that occurred within the time frame) was greater than the bias of telescoping (recalling events that occurred prior to the time frame of the study). This analysis shows that our estimates of the incidence of victimization among persons with SMI are lower than the true rates. To estimate the 12-month prevalence of victimization, we used the 936 baseline interviews; to estimate the rate of incidence, we used both the 936 baseline interviews and the 264 follow-up interviews.

COMPARISON GROUP

We chose a comparison group from the NCVS public use data that was the most similar to our sample of persons with SMI: NCVS data collected from all "central cities" (the largest cities of each standard metropolitan area) during the same years as our study; the average population sample per year was 32 449 persons. Chicago, for example, is the central city of the Chicago standard metropolitan area. (We used central cities because the public use data distributed by the NCVS do not contain information on city of residence to maintain confidentiality.)

STATISTICAL ANALYSIS

We report the same categories of crime and time frame (past 12 months) as NCVS publications.[46] Analyses were conducted using the survey estimation routines of Stata 8.1.[53] All inferential statistics are corrected using the stratification and weighting for the SMI sample described earlier and the pseudostrata information and weights provided with the NCVS data.[54] We weighted the NCVS data to reflect the demographic characteristics (race/ethnicity, sex, age, and income) of persons with SMI living in Chicago. We corrected for income because many persons with SMI are poor, and poverty is strongly correlated with victimization.[39]

Table 1. Twelve-Month Prevalence of Crime Victimization in the National Crime Victimization Survey and Among Persons With Severe Mental Illness, Prevalence Ratios (Relative to the National Crime Victimization Survey), and 95% Confidence Intervals

Type of Crime*	NCVS, % (95% CI) (n = 32 449)†	Persons With SMI, % (95% CI) (n = 936)	Prevalence Ratio (95% CI)‡
Violent personal crimes			
Any crimes of violence	2.79 (2.5-3.1)	25.32 (22.9-27.8)	11.8 (9.9-14.0)§
Completed violence	1.49 (1.3-1.7)	16.98 (14.9-19.0)	13.5 (11.0-16.6)§
Attempted/threatened violence	1.45 (1.2-1.7)	11.20 (9.6-12.8)	8.6 (6.8-10.8)§
Rape/sexual assault	0.16 (0.10-0.22)	2.64 (1.8-3.5)	17.2 (10.4-28.5)§
Rape/attempted rape	0.11 (0.06-0.16)	2.43 (1.6-3.3)	22.5 (12.7-40.1)§
Rape	0.07 (0.03-0.11)	1.60 (1.0-2.2)	22.5 (11.4-44.5)§
Attempted rape	0.04 (0.01-0.07)	0.83 (0.2-1.5)	21.7 (7.7-61.2)§
Sexual assault	0.07 (0.03-0.10)	1.00 (0.5-1.5)	15.0 (7.2-31.6)§
Robbery	0.51 (0.4-0.6)	3.94 (3.0-4.9)	7.9 (5.7-11.2)§
Completed/property taken	0.31 (0.2-0.4)	2.50 (1.8-3.2)	8.2 (5.4-12.6)§
With injury	0.12 (0.1-0.2)	0.87 (0.4-1.3)	7.3 (3.7-14.5)§
Without injury	0.19 (0.1-0.3)	1.74 (1.2-2.3)	9.1 (5.4-15.4)§
Attempted to take property	0.21 (0.1-0.3)	1.56 (1.0-2.1)	7.5 (4.4-12.8)§
With injury	0.07 (0.02-0.1)	0.39 (0.03-0.8)	5.7 (1.8-17.5)§
Without injury	0.14 (0.08-0.2)	1.17 (0.7-1.6)	8.4 (4.5-15.4)§
Assault	1.54 (1.3-1.8)	19.03 (16.9-21.1)	15.0 (12.2-18.5)§
Aggravated	0.49 (0.4-0.6)	6.05 (5.0-7.1)	13.1 (9.6-17.7)§
With injury	0.28 (0.2-0.4)	2.91 (2.2-3.6)	10.6 (7.0-15.9)§
Threatened with weapon	0.21 (0.1-0.3)	3.14 (2.4-3.9)	15.5 (9.9-24.2)§
Simple	1.10 (0.9-1.3)	14.46 (12.6-16.4)	15.2 (11.9-19.5)§
With minor injury	0.32 (0.2-0.4)	4.34 (3.3-5.4)	14.1 (9.7-20.5)§
Without injury	1.43 (1.2-1.7)	10.81 (9.2-12.5)	8.4 (6.5-10.7)§
Personal theft (theft of property from person)	0.19 (0.1-0.3)	21.22 (18.9-23.6)	140.4 (90.6-217.7)§
Property crimes	8.44 (7.8-9.1)	27.99 (25.2-30.7)	4.2 (3.6-5.0)§
Household burglary	2.62 (2.2-3.0)	11.65 (9.9-13.4)	4.9 (3.9-6.2)§
Completed	2.10 (1.8-2.4)	10.10 (8.4-11.8)	5.2 (4.1-6.7)§
Forcible entry	0.83 (0.6-1.0)	2.54 (1.7-3.3)	3.1 (2.1-4.7)§
Unlawful entry without force	1.29 (1.0-1.6)	7.72 (6.2-9.3)	6.4 (4.8-8.6)§
Attempted forcible entry	0.54 (0.4-0.7)	2.16 (1.5-2.8)	4.1 (2.6-6.3)§
Motor vehicle theft	0.48 (0.3-0.7)	1.18 (0.7-1.6)	2.5 (1.4-4.3)‖
Completed	0.37 (0.2-0.6)	1.03 (0.6-1.4)	2.8 (1.5-5.3)‖
Attempted	0.12 (0.05-0.2)	0.15 (−0.02 to 0.3)¶	1.3 (0.4-4.7)
Property theft	5.74 (5.2-6.3)	17.83 (15.5-20.1)	3.6 (3.0-4.3)§
Completed	5.58 (5.0-6.1)	17.69 (15.4-20.0)	3.6 (3.0-4.4)§
<$50	2.00 (1.7-2.3)	6.67 (5.4-8.0)	3.5 (2.7-4.6)§
$50-$249	2.12 (1.8-2.5)	6.68 (5.1-8.3)	3.3 (2.4-4.5)§
≥$250	1.33 (1.1-1.6)	5.65 (4.3-7.0)	4.4 (3.2-6.1)§
Unknown	0.43 (0.3-0.6)	NA#	NA#
Attempted	0.18 (0.1-0.3)	0.22 (0.1-0.4)	1.2 (0.6-2.5)

Abbreviations: CI, confidence interval; NA, not applicable; NCVS, National Crime Victimization Survey; SMI, severe mental illness.

*Categories and subcategories of type of crime are those used in NCVS publications.

†The n shown is the mean for 1997 (n = 35 044), 1998 (n = 32 717), and 1999 (n = 29 585). The NCVS prevalences include all persons living in the "central cities" (ie, the largest cities of each standard metropolitan area) of metropolitan statistical areas weighted to the age, sex, racial/ethnic, and income distribution of our sample of persons with SMI.

‡Ratio of prevalence for persons with SMI to prevalence reported in NCVS.

§The 2-tailed probability that the confidence bound of the prevalence ratio overlaps with 1.0 (no effect) is <.001.

‖The 2-tailed probability that the confidence bound of the prevalence ratio overlaps with 1.0 (no effect) is <.01.

¶Because the Taylor series linearization refers to the *t* distribution to calculate confidence bounds, the lower computed confidence bound of the prevalence ratio among persons with SMI may be below 0.

#The sample rate of theft of unknown value for persons with SMI is 0; confidence bounds and prevalence ratios are not reported.

RESULTS

PREVALENCE

Comparing Prevalence in the SMI Sample With Prevalence in the NCVS

Table 1 and **Table 2** report prevalence rates and prevalence ratios (the ratio of the prevalence of victimization of the SMI sample compared with the prevalence of victimization in the NCVS).

Over one quarter of the SMI sample had been victims of a violent crime (attempted or completed) in the past year, 11.8 times higher than the NCVS rates; nearly 17% of the SMI sample had been victims of completed violence (Table 1).

More than 21% of persons with SMI had been victims of personal theft (theft of an item from one's per-

Table 2. Twelve-Month Prevalence of Crime Victimization Among Men and Women With Severe Mental Illness, Prevalence Ratios (Relative to the National Crime Victimization Survey), and 95% Confidence Intervals*

Type of Crime†	Men, % (95% CI) (n = 483)	Prevalence Ratio (95% CI)‡	Women, % (95% CI) (n = 453)	Prevalence Ratio (95% CI)‡	*P* Values for Tests of Sex Differences in Annual Prevalence
Violent personal crimes					
Any crimes of violence	23.4 (19.9-27.0)	8.5 (6.6-10.9)§	27.1 (23.8-30.4)	15.6 (12.3-19.9)§	.14
Completed violence	13.6 (10.8-16.4)	8.7 (6.3-12.0)§	20.2 (17.3-23.1)	19.1 (14.6-25.1)§	.002
Attempted/threatened violence	12.4 (9.9-14.8)	7.3 (5.3-10.0)§	10.1 (8.1-12.1)	9.7 (6.8-13.7)§	.15
Rape/sexual assault	0.8 (−0.3 to 1.8)‖	32.5 (4.5-233.0)¶	4.3 (3.0-5.7)	18.5 (11.2-30.4)§	.02
Robbery	5.3 (3.7-6.8)	6.8 (4.4-10.4)§	2.7 (1.6-3.7)	8.8 (5.0-15.5)§	.007
Assault	17.5 (14.5-20.5)	11.2 (8.3-15.0)§	20.5 (17.6-23.3)	19.1 (14.2-25.8)§	.17
Aggravated	6.8 (5.3-8.4)	9.4 (6.3-14.0)§	5.3 (3.8-6.8)	18.5 (11.5-29.7)§	.17
Simple	12.5 (9.8-15.2)	12.4 (8.6-17.7)§	16.3 (13.7-18.9)	18.0 (12.8-25.4)§	.05
Personal theft (theft of property from person)	18.6 (15.3-22.0)	80.7 (41.6-156.2)§	23.7 (20.5-26.9)	238.3 (145.0-391.7)§	.04
Property crimes	28.0 (24.1-32.0)	4.1 (3.2-5.2)§	28.0 (24.0-31.9)	4.3 (3.4-5.4)§	.98
Household burglary	11.8 (9.0-14.6)	5.1 (3.5-7.3)§	11.5 (9.3-13.8)	4.8 (3.6-6.4)§	.88
Motor vehicle theft	0.7 (0.3-1.1)	1.9 (0.9-4.0)	1.6 (0.8-2.4)	3.0 (1.5-6.3)¶	.04
Property theft	17.5 (14.3-20.7)	3.1 (2.4-4.1)§	18.2 (14.7-21.6)	3.9 (3.0-5.1)§	.78

Abbreviation: CI, confidence interval.

*National Crime Victimization Survey prevalences include all persons living in the "central cities" (ie, the largest cities of each standard metropolitan area) of metropolitan statistical areas weighted to the age, sex, racial/ethnic, and income distribution of our sample of persons with severe mental illness.

†Categories and subcategories of type of crime are those used in National Crime Victimization Survey publications.

‡Ratio of prevalence for persons with severe mental illness to prevalence reported in the National Crime Victimization Survey.

§The 2-tailed probability that the confidence bound of the prevalence ratio overlaps with 1.0 (no effect) is <.001.

‖Because the Taylor series linearization refers to the *t* distribution to calculate confidence bounds, the lower computed confidence bound of the prevalence ratio among persons with severe mental illness may be below 0.

¶The 2-tailed probability that the confidence bound of the prevalence ratio overlaps with 1.0 (no effect) is <.01.

son), more than 140 times higher than the NCVS rates. The prevalence ratio is high because personal thefts are uncommon in the general population (0.2%).

Nearly 28% of persons with SMI had been victims of property crimes, approximately 4 times higher than the NCVS rates. These prevalence ratios are lower than the ratios for other crimes because property crimes are common in the general population (8.4%).

Prevalence Ratios in Key Demographic Subgroups: Sex, Race/Ethnicity, and Age

Do the significant prevalence ratios found in the overall sample also pertain to key demographic subgroups? We calculated prevalence ratios for the major subcategories of crime, controlling for sex (Table 2), race/ethnicity, and age. (Tables showing prevalence by race/ethnicity and age are available on our Web site.)

Prevalence ratios in Table 2 are statistically significant and similar to those for the total sample (Table 1), except for rape/sexual assault, which differs by sex. (The NCVS prevalence and confidence intervals stratified by sex are not shown but are available from us.)

Most prevalence ratios were statistically significant when controlling for race/ethnicity and age, except when the population samples were small.

Prevalence of Crime Victimization Among Persons With SMI

Does prevalence of victimization among persons with SMI differ by sex, race/ethnicity, and age?

Table 2 reports differences in prevalence within the SMI sample by sex. More women than men were victims of completed violence, rape/sexual assault, personal theft, and motor vehicle theft. Significantly more men than women were victims of robbery.

When there were racial/ethnic differences, prevalence was almost always higher among African American persons than among other racial/ethnic groups and lower among Hispanic persons. For example, among men, significantly more African American men (10.3%) than non-Hispanic white men (5.8%) or Hispanic men (5.3%) were victims of aggravated assaults. (Tables are available on our Web site.)

We examined age differences among persons aged 24 years and younger, aged 25 to 49 years, and aged 50 years and older. For many crimes, prevalence increased with age up to age 50 years. (Tables are available on our Web site.)

INCIDENCE

Comparing Incidence in the SMI Sample With Incidence in the NCVS

We present incidence the same way as the NCVS does, by calculating the number of incidents per 1000 persons per year. **Table 3** reports incidence rates and annual incidence ratios (the ratio of the annual incidence of the SMI sample compared with the annual incidence reported in the NCVS).

Among persons with SMI, there were 168.2 incidents of violent crime per 1000 persons per year, more than 4 times higher than the NCVS rates. Subcategories

Table 3. Twelve-Month Incidence of Crime Victimization per 1000 Persons in the National Crime Victimization Survey and Among Persons With Severe Mental Illness, Incidence Ratios (Relative to the National Crime Victimization Survey), and 95% Confidence Intervals

Type of Crime*	Annual Incidence per 1000 (95% CI)		Incidence Ratio (95% CI)‡
	NCVS (n = 6494 Incidents)†	Persons With SMI (n = 1170 Incidents)	
Violent personal crimes			
Any crimes of violence	39.93 (37.5-42.4)	168.21 (148.9-187.5)	4.2 (3.6-4.9)§
Completed violence	17.66 (16.0-19.3)	82.13 (68.3-96.0)	4.7 (3.7-5.8)§
Attempted/threatened violence	22.28 (20.4-24.1)	86.07 (71.6-100.6)	3.9 (3.1-4.8)§
Rape/sexual assault	2.28 (1.7-2.9)	17.03 (10.1-24.0)	7.5 (3.3-16.8)§
Rape/attempted rape	1.12 (0.7-1.6)	12.31 (6.2-18.4)	11.0 (4.6-26.0)§
Rape	0.68 (0.3-1.0)	8.39 (3.7-13.1)	12.3 (4.4-34.9)§
Attempted rape	0.44 (0.2-0.7)	3.92 (0.0-7.8)	8.9 (2.6-30.9)‖
Sexual assault	1.16 (0.7-1.6)	4.72 (1.3-8.1)	4.1 (1.6-10.5)‖
Robbery	6.85 (5.8-7.9)	23.83 (16.6-31.1)	3.5 (2.1-5.9)§
Completed/property taken	4.52 (3.7-5.4)	13.83 (8.2-19.4)	3.1 (1.9-4.8)§
With injury	1.39 (1.0-1.8)	5.18 (1.6-8.7)	3.7 (1.8-7.5)§
Without injury	3.13 (2.4-3.9)	8.65 (4.3-13.0)	2.8 (1.8-4.3)§
Attempted to take property	2.33 (1.7-2.9)	10.00 (5.3-14.7)	4.3 (1.8-10.0)‖
With injury	0.66 (0.4-1.0)	3.22 (0.2-6.2)	4.9 (2.0-12.2)‖
Without injury	1.68 (1.1-2.2)	6.78 (3.2-10.4)	4.0 (1.6-10.3)‖
Assault	30.80 (28.6-33.0)	127.35 (110.3-144.4)	4.1 (3.3-5.1)§
Aggravated	6.12 (5.1-7.1)	27.03 (19.8-34.2)	4.4 (2.9-6.8)§
With injury	3.14 (2.4-3.8)	12.12 (7.3-16.9)	3.9 (2.3-6.4)§
Threatened with weapon	2.99 (2.3-3.7)	14.91 (9.5-20.3)	5.0 (3.0-8.2)§
Simple	24.67 (22.7-26.6)	100.32 (84.6-116.1)	4.1 (3.3-5.1)§
With minor injury	4.73 (3.9-5.6)	24.25 (16.0-32.5)	5.1 (3.7-7.1)§
Without injury	19.94 (18.2-21.7)	76.07 (62.3-89.9)	3.8 (3.0-4.9)§
Personal theft (theft of property from person)	2.39 (1.8-3.0)	142.63 (123.1-162.2)	59.7 (44.1-80.9)§
Property crimes	232.46 (225.2-239.7)	374.28 (337.5-411.1)	1.6 (1.4-1.8)§
Household burglary	54.05 (50.5-57.6)	141.67 (115.4-168.0)	2.6 (2.2-3.1)§
Completed	44.85 (41.6-48.1)	119.46 (94.5-144.4)	2.7 (2.2-3.2)§
Forcible entry	18.60 (16.6-20.6)	25.54 (14.2-36.9)	1.4 (0.9-2.1)
Unlawful entry without force	26.24 (23.7-28.7)	93.92 (71.1-116.7)	3.6 (2.8-4.6)§
Attempted forcible entry	9.20 (7.8-10.6)	22.21 (12.5-32.0)	2.4 (1.6-3.7)§
Motor vehicle theft	15.40 (13.5-17.3)	11.32 (4.9-17.7)	0.7 (0.4-1.5)
Completed	11.16 (9.6-12.8)	6.96 (2.0-11.9)	0.6 (0.4-1.1)
Attempted	4.24 (3.3-5.2)	4.36 (0.3-8.4)	1.0 (0.2-4.9)
Property theft	163.02 (156.9-169.1)	221.29 (189.2-253.4)	1.4 (1.1-1.7)‖
Completed	156.66 (150.7-162.6)	220.45 (188.3-252.6)	1.4 (1.1-1.7)‖
<$50	50.39 (47.0-53.8)	87.29 (67.7-106.9)	1.7 (1.1-2.6)¶
$50-$249	57.04 (53.4-60.6)	75.15 (54.0-96.3)	1.3 (0.9-2.0)
≥$250	35.78 (32.9-38.7)	58.01 (38.8-77.2)	1.6 (1.3-2.1)§
Unknown	13.46 (11.8-15.2)	NA#	NA
Attempted	6.35 (5.2-7.5)	0.84 (−0.2 to 1.9)**	0.1 (0.0-0.4)§

Abbreviations: CI, confidence interval; NA, not applicable; NCVS, National Crime Victimization Survey; SMI, severe mental illness.

*Categories and subcategories of type of crime are those used in NCVS publications.

†The n shown is the mean for 1997 (n = 7172), 1998 (n = 6487), and 1999 (n = 5823). The NCVS incidences include all persons living in the "central cities" (ie, the largest cities of each standard metropolitan area) of metropolitan statistical areas weighted to the age, sex, racial/ethnic, and income distribution of our sample of persons with SMI.

‡Ratio of incidence for persons with SMI to incidence reported in NCVS.

§The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.001.

‖The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.01.

¶The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.05.

#The sample rates of this type of crime are 0; confidence bounds and incidence ratios are not reported.

**Because the Taylor series linearization refers to the *t* distribution to calculate confidence bounds, the lower computed confidence bound of the incidence ratio among persons with SMI may be below 0.

were 2.8 times (robbery without injury) to 12.3 times (rape) higher than NCVS rates.

Personal theft has the highest incidence ratio of any crime, with the incidence rates in the SMI sample being more than 59 times higher than the NCVS rates.

Persons with SMI had significantly higher incidences of most property crimes. The exceptions were motor vehicle theft (no significant difference) and attempted property theft (which occurred less frequently among persons with SMI than was reported in the NCVS).

Incidence Ratios in Key Demographic Subgroups: Sex, Race/Ethnicity, and Age

Do the significant incidence ratios found in the overall sample also pertain to key demographic subgroups? We

Table 4. Twelve-Month Incidence of Crime Victimization Among Men and Women with Severe Mental Illness, Incidence Ratios (Relative to the National Crime Victimization Survey), and 95% Confidence Intervals*

Type of Crime†	Men (n = 519 Incidents)		Women (n = 651 Incidents)		*P* Values for Tests of Sex Differences in Annual Incidence
	Annual Incidence per 1000 (95% CI)	Incidence Ratio (95% CI)‡	Annual Incidence per 1000 (95% CI)	Incidence Ratio (95% CI)‡	
Violent personal crimes					
Any crimes of violence	165.8 (136.9-194.6)	3.5 (2.8-4.4)§	170.5 (144.6-196.3)	4.9 (4.0-6.1)§	.81
Completed violence	76.6 (57.4-95.9)	3.9 (2.8-5.3)§	87.2 (67.4-107.0)	5.4 (4.1-7.2)§	.45
Attempted/threatened violence	89.1 (66.2-112.0)	3.3 (2.3-4.7)§	83.3 (65.1-101.4)	4.5 (3.6-5.7)§	.69
Rape/sexual assault	NA‖	NA	29.4 (17.8-41.0)	7.7 (5.2-11.5)§	NA
Robbery	36.3 (23.7-48.9)	3.6 (2.5-5.4)§	12.3 (4.6-20.1)	2.8 (1.4-5.4)¶	.002
Assault	125.9 (100.1-151.6)	3.4 (2.4-4.8)§	128.7 (106.0-151.4)	4.9 (3.8-6.4)§	.87
Aggravated	32.7 (22.2-43.3)	3.8 (2.1-6.9)§	21.8 (11.9-31.6)	5.2 (3.3-6.0)§	.14
Simple	93.1 (69.3-116.9)	3.3 (2.4-4.7)§	107.0 (86.1-127.8)	4.8 (3.8-6.2)§	.39
Personal theft (theft of property from person)	135.5 (107.3-163.7)	63.1 (38.1-104.6)§	149.2 (122.1-176.3)	58.0 (39.7-84.8)§	.49
Property crimes	390.0 (334.7-445.3)	1.6 (1.3-1.8)§	360.6 (311.5-409.6)	1.6 (1.4-1.9)§	.44
Household burglary	150.1 (107.7-192.6)	2.8 (2.4-3.3)§	134.3 (101.9-166.6)	2.5 (1.9-3.1)§	.56
Motor vehicle theft	6.7 (0.9-12.4)	0.4 (0.1-1.2)	15.4 (4.5-26.3)	1.2 (0.5-2.7)	.16
Property theft	233.2 (185.3-281.0)	1.3 (1.1-1.6)#	210.9 (167.6-254.2)	1.4 (1.0-1.8)#	.50

Abbreviations: CI, confidence interval; NA, not applicable; NCVS, National Crime Victimization Survey.

*The NCVS incidences include all persons living in the "central cities" (ie, the largest cities of each standard metropolitan area) of metropolitan statistical areas weighted to the age, sex, racial/ethnic, and income distribution of our sample of persons with severe mental illness.

†Categories and subcategories of type of crime are those used in NCVS publications.

‡Ratio of incidence for persons with severe mental illness to incidence reported in NCVS.

§The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.001.

‖There are too few cases of rape/sexual assault in the sample of men with severe mental illness to report incidence rates, incidence ratios, or tests by sex.

¶The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.01.

#The 2-tailed probability that the confidence bound of the incidence ratio overlaps with 1.0 (no effect) is <.05.

calculated incidence ratios for the major subcategories of crime, controlling for sex (**Table 4**), race/ethnicity, and age. (Tables on race/ethnicity and age are not shown but are available on our Web site.)

Table 4 shows that incidence ratios are statistically significant even after controlling for sex, except for the ratio for motor vehicle theft.

Most incidence ratios are statistically significant when controlling for race/ethnicity and age, except for some crimes among persons aged 24 years or younger, possibly because the population samples are small.

Incidence of Crime Victimization Among Persons With SMI

Does incidence of victimization among persons with SMI differ by sex, race/ethnicity, and age? Table 4 reports differences in rates within the SMI sample by sex. (Tables on race/ethnicity and age are available on our Web site.)

Table 4 compares incidence of victimization by sex in the SMI sample. Only 1 difference was statistically significant: men had a significantly higher incidence of robbery (36.3 incidents per 1000 persons per year) than did women (12.3 incidents per 1000 persons per year).

Among men, some incidences were significantly higher among African American men and non-Hispanic white men than among Hispanic men. Among women, there were no significant differences by race/ethnicity.

Men aged 25 to 49 years had significantly higher incidences of some personal crimes than persons in the other age groups. Women aged 25 to 49 years had significantly higher incidences of most personal crimes than those aged 50 years and older.

COMMENT

Crime victimization is a major public health problem among persons with SMI who are treated in the community. Even after controlling for demographic differences between our sample and the NCVS, the incidence of violent crime was more than 4 times greater among persons with SMI than the incidence reported in the NCVS. More than one quarter of persons with SMI had been victims of 1 or more violent crimes within the past year. For all crimes, prevalence ratios were higher than incidence ratios. This indicates that the high incidence among persons with SMI is not accounted for by a few persons being repeatedly victimized. Depending on the type of violent crime (rape/sexual assault, robbery, assault, and their subcategories), prevalence was 6 to 23 times greater among persons with SMI than among the general population.

Incidence and prevalence of personal theft were more than 50 times greater than the NCVS rates. More than 20% of persons with SMI had been victims of personal theft in the past year. Although personal theft often involved inexpensive items (cigarettes or small amounts of cash), these victimizations can heighten anxiety and a sense of vulnerability, which, in turn, may worsen psychiatric symptoms.

Property crimes (taking property from a place) were less prevalent than personal crimes. Nevertheless, the incidence and prevalence of property crimes were greater among persons with SMI than among persons in the general population who were included in the NCVS.

Can we estimate how many persons with SMI are victimized each year? To the extent that our findings (based

on a treatment sample) are generalizable to the approximately 11.9 million persons with SMI in the United States,[55,56] nearly 3 million persons with SMI are victims of 1 or more violent crimes each year. If the rates in Chicago are typical, urban mental health centers can expect nearly 25% of their clients to have been victims of 1 or more violent crimes (attempted or completed) each year.

Although the effect of victimization on mental health is incalculable, the financial costs are well documented. In the general population, the Department of Justice notes that an incident of assault (in our SMI sample, 127.4 incidents per 1000 persons per year) costs $9400 in lost productivity, medical care, mental health care, social services, property loss, damage, and impaired quality of life.[57] Rape/sexual assault (17.0 incidents per 1000 persons per year in the SMI sample) costs $87 000 per incident. Robbery (23.8 incidents per 1000 persons per year in the SMI sample) costs $8000 per incident.[57] (Costs of lost productivity may be lower among persons with SMI because many are unemployed; costs of additional mental health services may be higher.)

DEMOGRAPHIC DIFFERENCES IN PREVALENCE AND INCIDENCE

African American persons had higher prevalence and incidence rates of some crimes. Yet, prevalence and incidence were high among all racial/ethnic groups, probably because poverty—highly correlated with victimization—is common in our sample irrespective of race/ethnicity. Age differences in prevalence and incidence among the SMI sample generally mirrored those in the NCVS. For many crimes, persons aged 25 to 49 years had higher prevalence and incidence than persons aged 50 years and older. Older persons tend to stay at home more than younger persons do,[58,59] thus reducing their exposure to crime.

COMPARING OUR FINDINGS WITH PRIOR STUDIES

It is difficult to compare our findings with prior investigations of persons with SMI because few studies collected comparable data; no prior study examined incidence. Restricting our comparisons to US prevalence studies with 1-year recall periods, our prevalence differs by type of crime but appears to be higher than that found in the study by Hiday et al[1] of involuntarily admitted psychiatric inpatients and lower than that found in the study by Lehman and Linn[6] of board and care residents, the study by Goodman et al[31,32] of inpatients and outpatients, and the study by Cascardi et al[30] of psychiatric inpatients. Comparing our findings with other special populations, our prevalence of violent victimization appears to be lower than among homeless persons[60] and public housing residents[9] and most comparable with persons with developmental disabilities.[61]

LIMITATIONS

Because most crimes against persons are not reported to police[39] and national statistics on victimization are available only for homicide,[62] epidemiologic studies of victimization rely on self-report,[58,63] which limits validity and reliability. Although we used the same methods as the NCVS to collect and score incidents, our participants may have underreported or overreported victimization. Analyses of our bounded interviews suggest that our study may underestimate victimization, especially for property crimes.

Like most prior studies of persons with SMI,[1,2,4,5,31] we sampled persons in treatment, which limits generalizability. Thus, our findings may not pertain to the estimated 47% to 54% of persons who have SMI but do not receive mental health services[64,65] or to those treated solely by private practitioners. Victimization among untreated persons may be higher or lower than we report here. Because many participants were sampled from waiting rooms of outpatient clinics and from day treatment programs, our findings may be more generalizable to frequent users of services. Moreover, generalizability is limited to persons living in urban areas.

Because the NCVS does not disclose the city of residence, our comparison sample is from the central cities (largest cities) of all US standard metropolitan areas. This may or may not bias our comparisons. Moreover, because over 5% of persons in the general population have SMI,[55] our sample and the comparison group (participants in the NCVS) are not mutually exclusive. However, this would decrease the differences between our sample and the NCVS; the true difference may be greater than that which was observed.

We did not explore specific psychiatric disorders, comorbid psychiatric disorders, or other variables associated with severe mental illness, eg, conflictual social relationships,[5] substance use,[2,18] and homelessness.[2] The effects of these psychiatric variables will be explored in future articles.

Despite these limitations, our study has implications for research, treatment, and mental health policy.

FUTURE RESEARCH

We suggest the following for future investigations:

1. Use standard measures of victimization. Researchers should take advantage of instruments designed to assess victimization, such as the NCVS. Although the NCVS may require modifications for SMI populations, it provides comprehensive information on prevalence, incidence, and patterns of victimization; moreover, findings would then be comparable with national data.

2. Identify key risk factors and outcomes. Understanding patterns of vulnerability, risk, and sequelae provides the basis for effective preventive interventions. Many questions remain. How do disorder, personality, and treatment affect victimization? How do ecological characteristics known to mediate the relationship between socioeconomic status and victimization in the general population (eg, lifestyle, living in impoverished and high-risk neighborhoods, residential instability, homelessness, and substance abuse)[14,23,58,66,67] affect victimization among persons with SMI?

3. Study special populations and community samples of persons with SMI. More studies are needed of per-

sons with SMI who are at the greatest risk for victimization: adolescents, homeless persons, incarcerated persons, persons with comorbid disorders, and persons with developmental disabilities. Because this study and prior studies focused on treatment samples, it is imperative to investigate patterns of vulnerability, risk, and sequelae among the estimated 5 million persons in the United States with SMI who do not receive treatment.[65] Adding items from the NCVS to community-based epidemiologic surveys of mental disorder would be cost-effective and would generate much needed information on victimization among populations not in treatment. In addition, the NCVS, which currently excludes persons in institutions,[54] should include them.

IMPLICATIONS FOR TREATMENT AND MENTAL HEALTH POLICY

In the general population, crime victimization can cause anxiety, depression, substance use disorders, and posttraumatic stress disorder.[14,63,68-72] Among persons with mental disorders, victimization can exacerbate existing disorders, increase the likelihood of service use and hospitalization, and substantially diminish quality of life.[6,10,33,34,73,74] Moreover, victimization increases the likelihood of revictimization[34] and is associated with perpetration of violence among persons with SMI,[12,75,76] just as in the general population.[58,77,78]

To reduce victimization and its consequences, crime prevention programs for persons with SMI must be developed and implemented. In cooperation with police, mental health centers should develop skills-based prevention programs for persons with SMI. Educating persons with SMI about modifiable risk factors can help them develop skills that enhance personal safety, improve conflict management,[79] and decrease their vulnerability. Prevention programs should target known high-risk groups (eg, persons with SMI who are homeless,[60] abuse substances,[80] or have histories of childhood sexual abuse[81]), the most frequent crimes (personal theft and assault), and the most serious crimes (rape/sexual assault and robbery). Groups at greatest risk (eg, homeless persons or those not in treatment) may be the most difficult to reach.[82]

Clients must be screened and monitored to reduce victimization. Improving detection is the first step to improving services for victims. One study[30] of inpatients found that only 1 of 4 victims of partner- or family-perpetrated crimes within the past year had this documented in their records. Clients should be screened at intake and monitored throughout their treatment.[14,30,31] It is also important to screen for posttraumatic stress disorder, a common result of victimization. Posttraumatic stress disorder is often underdiagnosed in clinical settings,[30,73,83] yet can aggravate existing symptoms[84,85] and impair treatment outcomes.[86,87]

Interventions should be improved. Interventions can reduce revictimization and improve the quality of life among persons with SMI. Programs for victims of acquaintance rape and family violence could be adapted for persons with SMI.[3] Interventions should also address comorbid substance abuse, a significant risk factor for victimization that is common among persons with SMI[2,13,31] and that increases the risk of revictimization.[13,14] Treating substance abuse among persons with SMI will reduce personal vulnerability, reduce exposure to risk factors associated with the environment of substance abuse, and may reduce the likelihood of revictimization. Because victimization is common irrespective of sex, race/ethnicity, and age, interventions should be appropriate for persons of varied cultural and ethnic backgrounds.

Collaborative relationships should be built between the mental health system and the criminal justice system (police, prosecutors, victim-witness programs, and the courts). For example, police have been a key resource for persons with SMI since deinstitutionalization.[20] Recognizing their role as "streetcorner psychiatrists,"[88] many police departments train officers to manage mentally ill offenders and persons in crisis.[20,89] Our findings suggest that police should also be trained to manage crime victims with SMI. Improving collaborative relationships will increase the likelihood that victimizations will be reported, investigated, and successfully prosecuted.

Housing must be improved for persons with SMI. Many persons with SMI have unstable housing situations, are homeless,[25,26] or live in impoverished neighborhoods with high crime rates.[2] Poverty, homelessness, and transient living are correlated with victimization.[2,24,31] Improved housing and financial stability could reduce the vulnerability of persons with SMI to crime.

Among persons with SMI, violent victimization is far more prevalent (more than 25% within 1 year in this study) than perpetration of violence (4%-13%).[4,76] Nonetheless, negative stereotypes of persons with SMI dominate the public's view[90,91] and the behavioral scientists' focus. In a computerized search of MEDLINE and PsychINFO, we found 283 empirical or review articles mentioning crime victimization among persons with mental illness as compared with more than 13 times that many articles on violent perpetration. (Search parameters are available from the authors.) Crime victimization among persons with SMI must be addressed the same way as other health disparities are addressed: by using all available tools and resources to reduce the risks and consequences of this public health problem.

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