Abstract

This study investigated lifetime prevalence of criminal behavior in a population of male schizophrenia patients. A total of 282 schizophrenia patients was divided into three subgroups (representing schizophreniform disorder, acute schizophrenia, and chronic schizophrenia). The same number of control subjects was drawn from the general population and matched with the patients for sex, age, marital status, occupational level, and community size. The full account of conviction records in the criminal register was used as a measure of criminal behavior. Patients were 5 times more likely to have been convicted of violent crimes, 2½ times more likely to have been convicted of crimes against property, and almost 3 times more likely to have violated drug laws. Criminality rates in schizophrenia depended, however, not only on the type of offense but also on the type or stage of the illness, which contributes to criminal behavior to some extent independently of sociodemographic factors.


Crime and mental disorder are difficult to relate to each other. Both are difficult to define, heterogeneous, and partially determined by culture (Gunn 1977). Most studies of mental disorder and criminality have been based on unselected groups of discharged male psychiatric patients, differing proportions of whom have suffered from schizophrenia. In these studies, arrest rate was taken as a measure of criminal behavior, and comparisons were made at best with the general population. Some of these studies showed a higher arrest rate in mental patients than in the general population overall (Cocozza et al. 1978; Sosowsky 1978, 1980; Steadman et al. 1978; McFarland et al. 1989), some, more arrests for particular offenses (Rappaport and Lassen 1965; Giovannoni and Gurel 1967; Zitrin et al. 1976), and others, more arrests for patients with prior police records (Melick et al. 1979). In contrast, some older studies reported either no differences in arrest rate, or fewer arrests in patients than in the general population (Pollock 1938; Cohen and Freeman 1945). The same trend has been observed in rural settings (Durbin et al. 1977), in cases where adequate followup was provided (Laface et al. 1993), and in patients not previously convicted (Cook 1983; Shore et al. 1990). There seems to be a positive correlation between criminality and the acuity of patients' illness (Bovier et al. 1987; Link et al. 1992; Taylor 1993; Mulvey 1994). Correlations have also been made with lack of active treatment (Green 1981; Taylor 1987; Grubin 1991), delusions (Häfner and Böker 1982; De Pauw and Szulecka 1988), noncompliance with medication (McFarland et al. 1989), substance abuse (Bovier et al. 1987; McFarland et al. 1989; Swanson et al. 1990), homelessness (Martell 1991), and prior arrests (Melick et al. 1979; Shore et al. 1989; Cirincione et al. 1992).

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Samples of (mostly) randomly selected male prisoners or penitentiary inmates have also been studied to determine the prevalence of mental disorders. In these subjects the lifetime prevalence of schizophrenia was found either to be comparable to that in the community (Guzé 1976; Bland et al. 1990; Gunn et al. 1991) or to exceed it—especially with concurrent substance abuse (Taylor and Gunn 1984; Côté and Hodgins 1990; Abram and Teplin 1991). The special group of persons found not guilty by reason of insanity or judged incompetent to stand trial or unfit to plead consists mainly of chronic mental patients (Bloom et al. 1992), the majority of whom suffer from schizophrenia (Pfeiffer et al. 1967; Pasewark et al. 1979; Hodgins and Hébert 1984; Reich and Wells 1985; Lamb et al. 1988; Grubin 1991). Schizophrenia patients seem also to be overrepresented among mentally disordered, seriously violent offenders (Häfner and Böker 1982), murderers (Lindqvist 1986; Gottlieb et al. 1987), and murderers diagnosed as mentally ill (Lanzkrön 1963; Millaud 1989; Fido et al. 1992). Matricide seems to be highly specific to schizophrenia patients (Gillies 1965; Green 1981).

In a general population birth cohort study, men with a major mental disorder, including schizophrenia, were found to be 2.6 times more likely to have been convicted of a criminal offense than healthy men and were registered for more crimes of every type (Hodgins 1992). In two well-controlled field studies, self-reported violence correlated with mental illness, including schizophrenia (Swanson et al. 1990; Link et al. 1992).

Studies of criminality and mental illness devoted specifically to schizophrenia are rare. A high proportion (49%) of twins with schizophrenia had criminal records (Coid et al. 1993). Schizophrenia patients have been found to frequently be threatening and violent before admission (Tardiff and Sweilam 1980; Humphreys et al. 1992) and to have frequent contact with the police after discharge, though charges are usually dropped (Johnstone et al. 1991). In a sample of ICD-8 (World Health Organization 1967) males with schizophrenia, the proportion of criminally registered persons was the same as in the general population, though they had committed almost four times as many violent offenses (Lindqvist and Allebeck 1990). Substance abuse represented a risk factor for criminal behavior in this population (Lindqvist and Allebeck 1989; Soyka et al. 1993). No differences in self-reported criminality were found between schizophrenia patients and normal patients (Chuang et al. 1987) and between offenders with schizophrenia and matched nonoffenders with schizophrenia (Schanda et al. 1992). Also, a lower postdischarge criminality recidivism rate was found in offenders with schizophrenia than in matched offenders without schizophrenia who were referred for pretrial psychiatric assessments (Rice and Harris 1992).

In sum, the studies performed after 1965 demonstrate that mental patients' total arrest or conviction rates equal or exceed the corresponding general population rates. The latter finding has repeatedly been explained with the deinstitutionalization or criminalization hypothesis: Mentally ill offenders are more frequently arrested and shifted into the penal system now because of unavailability of mental health disposition resulting from more stringent commitment criteria, more rapid discharges from psychiatric hospitals, refusal of these hospitals to admit especially dangerous patients, lack of psychiatric beds, inadequate community mental health resources, and so on (Rabkin 1979; Borzecki and Womith 1985; Abram and Teplin 1991; Davis 1992). Accordingly, some researchers have found an increasing proportion of State mental hospital patients with prior arrests (Cozza et al. 1978; Melick et al. 1979) and of young, mentally ill incoming prisoners (Jemelka et al. 1989). Among homeless persons, those who had previous psychiatric hospitalizations were most frequently involved in criminal behavior (Gelberg et al. 1988). Other researchers, however, have found little evidence that seriously mentally disturbed persons are preferentially placed in jails (Monahan et al. 1979) and have stressed biases in practically all studies (Wessely and Taylor 1991).

The present investigation was carried out to deepen our knowledge of criminal behavior in schizophrenia patients. We restricted our study to males, who are responsible for 85 to 90 percent of criminal offenses. Particular subgroups of mental patients should be studied (Cirincione et al. 1992), since criminality rates among them differ (Coid et al. 1993). The present study has six outstanding features. (1) Schizophrenia patients exclusively were studied (diagnosis was based on modern operationalized diagnostic criteria). (2) The patients were compared with a carefully matched control group drawn from the general popula-
tion. (3) Both patients and control subjects were recruited from the same catchment area. (4) The data were tested and found to be reliable. (5) A full account of court convictions was used as an objective measure of criminal behavior. (6) Lifetime prevalence of criminal behavior was investigated.

Methods

Subjects. Our subjects were males with schizophrenia hospitalized at least once at the Psychiatric University Hospital of Berne from 1985 to 1987. (The hospital provides complete care for all residents of the catchment area who need inpatient psychiatric treatment.) Eligible patients fulfilled the following criteria: They were between 18 and 78 years old at the time of data collection (1987); to our knowledge, they were still alive by the end of 1989; they met the Research Diagnostic Criteria (RDC; Spitzer et al. 1978) for schizophrenia; and basic demographic data were available, making identification of matched control subjects possible. A total of 1,590 men were treated in the hospital in the 3-year study period. Of these, 78 were excluded because they did not fulfill the age criteria. The 1,331 patients who had received the clinical diagnosis of schizophrenia or a related disorder (ICD-9 Nos. 295 [except 295.7], 297–298 [except 298.0]; n = 369), alcohol abuse/dependency (ICD-9 Nos. 291, 303, 304.7/8/9, 305.0/9; n = 624), or affective disorder (ICD-9 Nos. 295.7, 296, 298.0, 300.4, 301.1, 308.0/4, 309.0/1/4, 311, 312.3, 313.1/8; n = 338) were rediagnosed with the help of the RDC.

Using the method of retrospective evaluation of clinical charts, RDC schizophrenia was diagnosed in 292 patients, 246 (84%) of whom had been clinically diagnosed with schizophrenia. For four of these patients, matching was not possible; for two no control person could be found. One patient was known to have died, and three dropped out for other reasons. Thus, 282 patients were qualified for the study. DSM-III-R (American Psychiatric Association 1987) criteria for schizophrenia were also applied and found to be fulfilled in 224 (79%) of these patients. In contrast to RDC, DSM-III-R requires deterioration in psychosocial functioning and a substantially longer symptom duration (6 months vs. 2 weeks).

The control group was selected from the catchment area’s general population. The registration of the population in Switzerland takes place at the level of highly independent local communities. To obtain a matched control group, we contacted the local authorities in 55 out of 101 communities in the catchment area; 42 were willing to collaborate. With the exception of the city of Berne, each local authority was provided with the selected patients’ demographic data, along with the initials of the potential controls (the next in the alphabet following the initials of the patients’ names) to indicate the starting point for the search in the community file. These files register all inhabitants whose permanent place of residence is in the particular communities. Temporary absences, including long hospital or prison stays, do not lead to exclusion from the file. We instructed our collaborators from the respective local authorities by phone until we were sure they understood the procedure well. Phone calls were followed up by written instructions.

We were careful to recruit both patients and controls from communities of comparable size in the same catchment area. The collaborators searched the files for persons of the same sex, age (± 2 years), marital status, and occupational level, the latter to allow the social class designation according to Moore and Kleining (1960) and modified by Dilling and Weyerer (1978). For the city of Berne itself, we received the coded list of all inhabitants containing the appropriate data, and we looked for controls ourselves.

Hospital clinical records of all 282 patients were scrutinized and relevant data extracted by an investigator (R.A.) blind to the patients’ criminal status. These demographic and psychosocial variables were evaluated: age, marital status, foreign-born status, place of residence, educational level, highest social class ever reached by the patient and his family, intergenerational social mobility, living and vocational situation at the time of index admission, and guardianship measures. The psychiatric variables examined included RDC and DSM-III-R diagnosis of schizophrenia, age at first psychiatric therapy, age at first psychiatric hospitalization, duration of psychiatric illness, number and duration of psychiatric hospitalizations, total time spent in psychiatric hospitals; psychiatric disorders leading to hospitalization and alcoholism in first-degree relatives; broken home, childhood abuse, aggressive behavior, previous suicide attempts, and alcohol and drug abuse (assessed with the help of RDC). All
references in the hospital charts to criminal activity and to psychiatric hospitalizations resulting from decompensation during arrests were also noted. All variables were either clearly determinable (e.g., age) or were defined and operationalized as exactly as possible (e.g., patients were judged as coming from broken homes if at least one parent or parent surrogate was lacking for at least 2 years before age 18; the first contact with psychiatric services was decided to represent the beginning of the illness). In the absence of clear positive chart information (e.g., no mention of suicide attempts), negative ratings were encoded.

Clinical charts give information of sufficient validity and reliability provided they are filled out properly (Csernansky et al. 1983). Our clinical charts were generally of acceptable quality, and the ratings were reliable. A total of 66 clinical charts (15 of 282, every 20th of 1,331, all studied in the same way) were evaluated independently by two other investigators. The three scorings were compared with each other; four variables of low reliability were excluded from the analysis. The average correlation coefficients for all continuous variables included in the analysis were between 0.90 and 1.00. The average weighted kappas (Spitzer et al. 1967) for all the variables listed above (12 variables including two categories, 8 variables including three to six categories) were between 0.70 and 1.00. In many cases the charts included psychiatrists' expert opinions and clinical records from other psychiatric institutions. Therefore, hardly any data were missing. Social class of the family of origin could not be identified in 32 patients, educa-
tional level in 4 patients, work situation before index admission in 3 patients, and living situation at index admission in 1 patient.

In this study, full account of conviction records in the criminal register served as a measure of criminal behavior. Individuals' criminal activity in Switzerland is registered most completely in the Swiss Central Criminal Record Department. All court convictions are recorded, except for some small fines and trivial offenses. No compulsory registration is required for those under age 18, and no registration at all is required for those over age 80. The Division of Penal Control of the Canton of Berne registers convictions of citizens of Berne; here, even some minor law infractions not registered by the Swiss Central Criminal Record Department are recorded. Registration of some minor offenses can be deleted by the Swiss Central Criminal Record Department after 15 years and by the Division of Penal Control of the Canton of Berne after 3 years.

After the names of the study subjects had been forwarded by us (in the case of the patients) and by the local authorities (in the case of the controls) to the Swiss Central Criminal Records Department and to the Division of Penal Control of the Canton of Berne, we were provided with data indicating the type and number of law infractions and the type and number of sentences. The procedure corresponded to the Instructions of the Swiss Government for treating personal data for scientific purposes (issued March 16, 1981) and was approved by the representative of the Canton of Berne responsible for questions of data protection. Full confidentiality was strictly maintained throughout the study. Altogether, we were able to study life prevalence (starting at the age of 18) of all infractions leading to prison sentences of more than 3 months duration, all infractions committed in the prior 15 years and leading to fines of at least 500 Swiss francs (sFr) or prison sentences, and all infractions committed in the prior 3 years and leading to fines of at least 200 sFr (or 80 sFr in the case of traffic law violations).

Statistics. Statistical analysis used the chi-square test (with continuity correction when appropriate) and Fisher exact test for categorical variables. The t-test and the non-parametric Kruskal-Wallis test were used for continuous variables. To compare the likelihood of committing offenses in patients and controls, odds ratios were calculated. As a multivariate procedure, a stepwise discriminant analysis was used to select the set of variables best discriminating between patients with and without criminal records. The significance level for the variables to enter and stay in the model was 0.05. In the entire study, only results yielding a p-value of 0.05 or less were considered statistically significant.

Results

First, our 282 schizophrenia patients were compared with the general male population of the catchment area aged 18 to 78. Highly significant differences in the matching criteria were found: The patients were younger (mean age = 39 vs. 43), mostly single (85% vs. 33%), of low social class (64% vs. 32%) and resided more
frequently in the city of Berne (40% vs. 33%).

All 282 patients fulfilled the RDC criteria for schizophrenia. Nevertheless, the group was heterogeneous. Therefore, it was divided into three subgroups: (1) 58 patients fulfilling RDC criteria for schizophrenia but not DSM-III-R criteria for schizophrenia (schizophreniform disorder subgroup); (2) 160 patients fulfilling both RDC and DSM-III-R criteria for schizophrenia and hospitalized less than 1 year (acute schizophrenia subgroup); and (3) 64 patients fulfilling both RDC and DSM-III-R criteria for schizophrenia and hospitalized more than 1 year during the index hospitalization (chronic schizophrenia subgroup).

The sample’s heterogeneity was confirmed by significant differences between the three subgroups in matching criteria and in personal, social, and illness-related variables. Patients with schizophreniform disorder more frequently were foreign-born and came from broken homes. Most had regular jobs before index admission, and their hospitalizations were shorter. In contrast, the chronic schizophrenia subgroup consisted of older patients who were more severely ill, had been ill longer, and were more socially handicapped. The patients of all three subgroups fell ill at a similar mean age of 25 years. The increasing mean illness duration (7, 11, and 30 years) and mean total duration of psychiatric hospitalizations (0.5, 2.5, and 23 years) reflect the increasing illness severity across the three subgroups. These figures also yield an estimate of the mean risk period for the patients of the three subgroups: 6.5, 8.5, and 7 years.

Table 1 compares criminal behavior in the patient and control samples. The criminal registration rate was similar for patients and controls in the total sample as well as in the three subgroups; the patients were not criminally registered more frequently than their corresponding controls. In agreement with this finding, no differences in kind of sentence were found between patients and controls, except for the expected higher rate of psychiatric measures (i.e., sentences to psychiatric treatment) in the case of the patients (12% vs. 3%). Altogether, 34 percent of patients and 36 percent of controls had criminal records. The high percentage of controls with criminal records underscores the need for matching; only 15 percent of the general male population of the Canton of Berne had a criminal record.

Significant differences between patients and controls appeared when individual crime categories were considered (table 2). Patients were five times more likely to have been convicted of violent crimes, 2½ times more likely to have been convicted of crimes against property, and almost 3 times more likely to have violated drug laws. In contrast, they were less likely to have violated traffic laws. Nevertheless, traffic violations and property crimes were the most frequent offenses. Most violent crimes were assaults resulting in bodily harm. One murder was identified (a 46-year-old man diagnosed with schizophreniform disorder at index hospitalization had committed murder 9 years before).

Table 3 compares the three diagnostic subgroups with the corresponding controls in type of criminal offense. The following sta-

<table>
<thead>
<tr>
<th>Total sample</th>
<th>Schizophreniform disorder</th>
<th>Schizophrenia, acute</th>
<th>Schizophrenia, chronic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patients/controls</td>
<td>282</td>
<td>97 (34)</td>
<td>19 (63)</td>
</tr>
<tr>
<td>Criminal records</td>
<td>160 (56)</td>
<td>62 (31)</td>
<td>19 (58)</td>
</tr>
</tbody>
</table>

Note: **p < 0.05; *p < 0.01**

These figures also yield an estimate of the mean risk period for the patients of the three subgroups: 6.5, 8.5, and 7 years.
Table 2. Comparison of different offenses of patients (total sample) and controls, n (%)

<table>
<thead>
<tr>
<th>Offense</th>
<th>Total patients/ controls</th>
<th>Patients with criminal records</th>
<th>Controls with criminal records</th>
<th>Significance</th>
<th>Odds ratio</th>
<th>95% Confidence Interval</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violent crimes</td>
<td>282</td>
<td>15 (5)</td>
<td>3 (1)</td>
<td>6.94</td>
<td>0.008</td>
<td>5.22</td>
</tr>
<tr>
<td>Crimes against property</td>
<td>53 (19)</td>
<td>24 (9)</td>
<td>1 (1)</td>
<td>11.79</td>
<td>0.0006</td>
<td>2.49</td>
</tr>
<tr>
<td>Sexual offenses</td>
<td>9 (3)</td>
<td>4 (1)</td>
<td></td>
<td>NS</td>
<td></td>
<td>2.29</td>
</tr>
<tr>
<td>Violations of drug laws</td>
<td>29 (10)</td>
<td>11 (4)</td>
<td></td>
<td>7.78</td>
<td>0.005</td>
<td>2.82</td>
</tr>
<tr>
<td>Violations of traffic laws</td>
<td>58 (21)</td>
<td>88 (31)</td>
<td></td>
<td>7.77</td>
<td>0.005</td>
<td>0.57</td>
</tr>
<tr>
<td>Other offenses</td>
<td>43 (15)</td>
<td>31 (11)</td>
<td></td>
<td>NS</td>
<td></td>
<td>1.46</td>
</tr>
</tbody>
</table>

Note.—$\chi^2$ (1 df). NS = not significant.

Table 3. Comparison of different criminal offenses of the three patient diagnostic subgroups and their corresponding controls, odds ratios (95% confidence intervals)

<table>
<thead>
<tr>
<th>Offense</th>
<th>Schizophreniform disorder (58 patients vs. 58 controls)</th>
<th>Schizophrenia acute (160 patients vs. 160 controls)</th>
<th>Schizophrenia chronic (64 patients vs. 64 controls)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Violent crimes</td>
<td>3 patients/0 controls</td>
<td>3.86 (1.06–14.12)</td>
<td>1 patient/0 controls</td>
</tr>
<tr>
<td>Crimes against property</td>
<td>5.30 (1.42–19.74)</td>
<td>2.34 (1.23–4.45)</td>
<td>1.45 (0.43–4.83)</td>
</tr>
<tr>
<td>Sexual offenses</td>
<td>4.22 (0.46–38.98)</td>
<td>1.34 (0.29–6.09)</td>
<td>1 patient/0 controls</td>
</tr>
<tr>
<td>Violations of drug laws</td>
<td>6.55 (1.38–31.05)</td>
<td>2.26 (0.95–5.40)</td>
<td>1.00 (0.06–16.34)</td>
</tr>
<tr>
<td>Violations of traffic laws</td>
<td>0.64 (0.28–1.47)</td>
<td>0.61 (0.38–1.00)</td>
<td>0.34 (0.12–0.94)</td>
</tr>
<tr>
<td>Other offenses</td>
<td>2.26 (0.78–6.51)</td>
<td>1.82 (0.97–3.42)</td>
<td>0.13 (0.01–1.08)</td>
</tr>
</tbody>
</table>

had the highest criminal recidivism rate in general, particularly for

- Patients with schizophrenia, had the highest criminal recidivism rate in general, particularly for
### Table 4. Comparison of recidivism and age at first offense of patients and controls with criminal records

<table>
<thead>
<tr>
<th></th>
<th>Patients with criminal records (n = 97)</th>
<th>Controls with criminal records (n = 102)</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age of first adult offense</td>
<td>24.9 (7.8)</td>
<td>29.5 (11.5)</td>
<td>9.65 0.002</td>
</tr>
<tr>
<td>Average number of all offenses</td>
<td>5.9 (7.6)</td>
<td>4.2 (4.8)</td>
<td>5.92 0.015</td>
</tr>
<tr>
<td>per offending subject</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note.—SD = standard deviation.

### Table 5. Comparison of the three subgroups in type of offense and other criminality indexes

<table>
<thead>
<tr>
<th></th>
<th>Schizophreniform disorder (n = 58)</th>
<th>Schizophrenia acute (n = 160)</th>
<th>Schizophrenia chronic (n = 64)</th>
<th>Significance (df = 2)</th>
</tr>
</thead>
<tbody>
<tr>
<td>All offenses, n (%)</td>
<td>19 (33)</td>
<td>68 (43)</td>
<td>10 (16)</td>
<td>14.72 0.0006</td>
</tr>
<tr>
<td>Violent crimes, n (%)</td>
<td>3 (5)</td>
<td>11 (7)</td>
<td>1 (2)</td>
<td>NS</td>
</tr>
<tr>
<td>Crimes against property, n (%)</td>
<td>13 (22)</td>
<td>33 (21)</td>
<td>7 (11)</td>
<td>NS</td>
</tr>
<tr>
<td>Sexual offenses, n (%)</td>
<td>4 (7)</td>
<td>4 (3)</td>
<td>1 (2)</td>
<td>NS</td>
</tr>
<tr>
<td>Violations of drug laws, n (%)</td>
<td>11 (19)</td>
<td>17 (11)</td>
<td>1 (2)</td>
<td>10.03 0.007</td>
</tr>
<tr>
<td>Violations of traffic laws, n (%)</td>
<td>13 (22)</td>
<td>39 (24)</td>
<td>6 (9)</td>
<td>6.45 0.040</td>
</tr>
<tr>
<td>Other offenses, n (%)</td>
<td>12 (21)</td>
<td>30 (19)</td>
<td>1 (2)</td>
<td>12.12 0.002</td>
</tr>
<tr>
<td>Primary psychiatric measures instead of legal prosecution, n (%)</td>
<td>9 (16)</td>
<td>40 (25)</td>
<td>19 (30)</td>
<td>NS</td>
</tr>
<tr>
<td>Age at first adult offense mean (SD)¹</td>
<td>21.3 (4.2)</td>
<td>25.3 (7.4)</td>
<td>29.0 (12.7)</td>
<td>5.34 0.069</td>
</tr>
<tr>
<td>Average number of offenses per offending proband, mean (SD)²</td>
<td>11.9 (13.9)</td>
<td>4.5 (3.9)</td>
<td>4.0 (3.6)</td>
<td>8.19 0.017</td>
</tr>
<tr>
<td>Number of traffic violations per offending proband, mean (SD)²</td>
<td>8.5 (9.8)</td>
<td>2.3 (1.5)</td>
<td>2.0 (1.1)</td>
<td>9.20 0.010</td>
</tr>
<tr>
<td>Offenses before first psychiatric hospitalization, n (%)¹</td>
<td>14 (74)</td>
<td>40 (59)</td>
<td>3 (30)</td>
<td>5.16 0.076</td>
</tr>
</tbody>
</table>

Note.—Kruskal-Wallis test for continuous variables. NS = not significant; SD = standard deviation.

¹ n = 18, n = 68, and n = 10.
² n = 13, n = 39, and n = 6.
traffic violations. Most had engaged in criminal activity before their first psychiatric hospitalization.

Altogether, 57 patients (59%) with a criminal record had been registered for the first time before their first psychiatric hospitalization, and 40 (41%) afterward. Thus, the beginning of the criminal behavior was quite equally distributed around the time of the first inpatient treatment. This finding could be confirmed for all offenses except violent crime: of the 15 patients with criminal records for violent crimes, 3 (20%) had been convicted before, and 12 (80%) were convicted after their first hospitalization. The patients with criminal records before their first hospitalization were more likely than patients without such criminal records to be criminally active later (47% vs. 18%).

Patients with and without criminal records were compared. The significant differences are given in table 6. Patients who had committed crimes were found to be younger, to have had shorter illnesses, and to have spent less time in psychiatric hospitals. They more frequently presented histories of alcohol and drug abuse, and their social situations at index admission were less favorable. Repeating the same type of comparison but excluding chronic patients, differences in age, illness duration, total time spent in psychiatric hospitals, and average duration of psychiatric hospitalization lost significance. Regarding drug abuse, a positive correlation was found with violations of drug laws ($r = 0.4, p < 0.0001$) and with crimes against property ($r = 0.3, p < 0.0001$) but not with violent ($r = -0.06$, not significant) or other crimes. No differences were found between subgroups of schizophreniform and schizophrenia patients in proportion to patients with criminal records (33% and 42%, respectively). As table 6 shows, in most patients with crim-

### Table 6. Significant differences between male schizophrenia inpatients with and without criminal records

<table>
<thead>
<tr>
<th></th>
<th>Patients with criminal records</th>
<th>Patients without criminal records</th>
<th>Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schizophreniform disorder, n (%)</td>
<td>19 (20)</td>
<td>39 (21)</td>
<td>14.72</td>
</tr>
<tr>
<td>Schizophrenia acute, n (%)</td>
<td>68 (70)</td>
<td>92 (50)</td>
<td>(df = 2)</td>
</tr>
<tr>
<td>Schizophrenia chronic, n (%)</td>
<td>10 (10)</td>
<td>54 (29)</td>
<td></td>
</tr>
<tr>
<td>Age (years), mean (SD)</td>
<td>33.4 (10.2)</td>
<td>42.2 (17.1)</td>
<td>12.61</td>
</tr>
<tr>
<td>Duration of illness (years), mean (SD)</td>
<td>10.2 (10.8)</td>
<td>16.6 (15.5)</td>
<td>7.91</td>
</tr>
<tr>
<td>Total time spent in psychiatric hospitals (years), mean (SD)</td>
<td>2.8 (6.0)</td>
<td>8.8 (14.3)</td>
<td>3.95</td>
</tr>
<tr>
<td>Average duration of psychiatric hospitalization (months), mean (SD)</td>
<td>5.6 (14.2)</td>
<td>29.7 (67.0)</td>
<td>5.69</td>
</tr>
<tr>
<td>Alcohol abuse, n (%)</td>
<td>52 (54)</td>
<td>59 (32)</td>
<td>11.68</td>
</tr>
<tr>
<td>Drug abuse, n (%)</td>
<td>37 (38)</td>
<td>28 (15)</td>
<td>17.72</td>
</tr>
<tr>
<td>No regular job at index admission, n (%)</td>
<td>75 (79)</td>
<td>118 (64)</td>
<td>5.77</td>
</tr>
<tr>
<td>Homeless at index admission, n (%)</td>
<td>16 (16)</td>
<td>8 (4)</td>
<td>10.59</td>
</tr>
<tr>
<td>Psychiatric hospitalization following arrest or imprisonment, n (%)</td>
<td>20 (21)</td>
<td>6 (3)</td>
<td>20.92</td>
</tr>
<tr>
<td>Chart information on law infractions, n (%)</td>
<td>80 (82)</td>
<td>73 (39)</td>
<td>45.72</td>
</tr>
</tbody>
</table>

Note.—Kruskal-Wallis test for continuous variables. $\chi^2$ test with 1 df unless indicated. SD = standard deviation.

1 No more significant with chronic patients excluded.
The patients without criminal records were noted in our clinical charts. Interestingly, law infractions were also noted in almost 40 percent of the patients without criminal records.

The stepwise discriminant analysis yielded the set of three variables best discriminating between patients with and without criminal records: drug abuse, homelessness at index admission, and divorced or widowed marital status. Discriminatory power of the model is very modest (13% of explained variance), confirming the difficulties in differentiating between patients with and without criminal records using the variables we studied. Likewise, the specificity of the model is 78 percent and its sensitivity only 55 percent.

Discussion

In contrast to many previous studies of criminal behavior of mental patients, court convictions and not arrests were used here as a measure of criminal behavior. Arrest rates are influenced by noncriminalological variables (Teplin 1985), do not indicate seriousness of crimes (Davis 1991), and do not denote guilt, since criminal activity is necessarily determined only by a judge in court (Rabkin 1979). Only a small proportion of arrested patients are convicted (McFarland et al. 1989). Swiss law does not recognize the categories of “incompetent to stand trial” or “not guilty by reason of insanity.” All offenses—but serious offenses especially (e.g., those involving guns, easily available in Switzerland)—are judged by the court, which may rule, however, for psychiatric instead of penal measures. These measures are also registered. Conviction records are objective but may underestimate the criminality of people with mental disorders. As reported, many patients break the law or are violent before hospital admission (Levine 1970; Tardiff and Sweillam 1980; Humphreys et al. 1992) without being arrested (Lagos et al. 1977), and the police avoid arresting those individuals for minor crimes who enter a mental hospital (Craft 1984). Confronted with less serious offenses, Swiss police have considerable discretionary powers and can present mentally disordered suspects to physicians (who may decide on hospital referrals), charge them, or both. Accordingly, in almost 40 percent of our patients without criminal records, some references to law infractions were found in the clinical charts. Healthy people may be handled by Swiss police in less considerate ways but may be better at concealing their offenses. Unfortunately, we do not know the frequency of undetected crime in the general population, or whether unrecorded crimes favor the relatively healthy or the mentally disordered (Taylor 1993).

All our patients were hospitalized at least once for mental problems. There might be a selection bias in comparing hospitalized patients with community controls, since the hospital entry procedure likely selects patients at higher risk for violence and therefore criminal conviction. Unfortunately, there is no community-based psychiatric register in Switzerland. Most schizophrenia patients, however, will have been hospitalized at some time during their patient career. For example, all 51 schizophrenia patients who contacted the psychiatric outpatient service in Berne during a 1-year period had been hospitalized in the past (Hoffmann 1994). Some of the mentally ill could have been included in our control group, which also might have contained some subjects with drug abuse problems and personality disorders. Unfortunately, the schizophrenia and control groups could not be matched for these variables. The effect that this lack of matching may have had on our results is not known. There are methodological problems in studying crime in mental illness, and no single study will overcome them all (Wessely and Taylor 1991).

Significant differences were found between our patient sample and the general population in matching criteria. These differences, along with the finding of a high percentage of matched controls with criminal records (36% vs. 15% of the male general population) underline the importance of matching. Sex, age, marital status, place of residence, and social class are among the factors most significantly affecting crime rates (Guze 1976; Braithwaite 1981; Rice and Harris 1992). Differences in these variables were found between criminal and noncriminal mentally ill patients (Beran and Hotz 1984), between imprisoned persons and the general population (Bland et al. 1990), and among expatients, exoffenders, and the general population (Steadman and Felson 1984). Admittedly, controlling for factors that can themselves be influenced by mental disorder may be problematic (Monahan 1993). For this reason, the highest social class ever achieved, rather than current social class, was considered in our study.

As our results indicate, the group of patients with RDC schiz-
patients with schizophrenia do not represent a uniform population. The subgroup of long-stay/chronic inpatients especially is different in being more severely ill and more handicapped. This heterogeneity is also reflected in differences in criminal behavior. In both the total sample and the diagnostic subgroups, the same high proportions of criminally registered individuals were found in the patients as in the controls (34% vs. 36%). Significant differences appeared when different types of offenses were considered, however, the diagnostic subgroups contributed in various ways to these differences. Altogether, a significantly higher proportion of patients committed violent crimes, crimes against property, and drug-related crimes; a significantly lower proportion violated traffic laws. Nevertheless, even in the patients, traffic violations represented the most common kind of offense. Patients with chronic schizophrenia had been convicted less frequently than patients in the other two groups, in spite of their similarly long mean risk period as patients discharged to the community. Because they represent significantly older patients, the differences in criminality rates between them and other patients could result from a cohort effect, particularly pronounced in violations of drug and traffic laws. Compared with controls, patients with schizophreniform disorder were 6½ times more likely to break drug laws, while patients with acute schizophrenia were 4 times more likely to have been convicted of violent crimes. In contrast to the latter finding, patients with schizophreniform disorder and chronic schizophrenia were found to be as likely as controls to commit violent crimes. These results explain the different findings of this and our previous study (Modestin and Ammann 1995), in which no differences in the frequency of violent crimes were found between the group consisting of patients with ICD-9 schizophrenia (74%) and schizophrenia-related disorders (26%) and the group of matched controls. That ICD-9 “schizophrenia” group will have contained only a small proportion of DSM-III-R acute schizophrenia patients according to our definition.

A higher recidivism rate was found in the patients than in the controls. The subgroup with schizophreniform disorder especially had a high recidivism rate, possibly because of traffic violations. Some of these patients may belong to a new generation of young adult chronic outpatients presenting with considerable social handicaps and stormy lifestyles yet not getting the benefits of more extended hospital treatment (Lamb 1993).

Since we were not able to determine the beginning of the illness reliably, we cannot comment on its relationship to the beginning of criminal behavior. The finding of a significant correlation \( r = 0.66 \) between age at first psychiatric contact and age at first conviction (Coid et al. 1993) could not be replicated in this study \( r = 0.17, p = 0.093 \). Generally, a patient can start a criminal career at any age (Hodgins 1992). Our patients started their adult criminal careers at significantly earlier ages than the controls, and a considerable number of patients, particularly those with schizophreniform disorder and acute schizophrenia, had already been criminally active before their first psychiatric hospitalization. This was, however, not the case for violent crimes: 12 of 15 patients with histories of violent crime had been hospitalized before becoming criminal. These data indicate that violent crime is more closely connected with the illness than other types of crime. Likewise, violence was observed to progress as the illness progressed (Taylor 1987). The finding that past criminality predicts future criminality (Melick et al. 1979; Shore et al. 1989; Cirincione et al. 1992) could be fully confirmed.

Compared with noncriminal schizophrenia patients, our criminal patients were younger and less ill. They were also more frequently involved in substance abuse and were less well integrated socially (i.e., more frequently unemployed and homeless). The latter findings remained significant even after the chronic schizophrenia subgroup was excluded. It is possible that symptom acuity, which is known to correlate with criminal behavior (Link et al. 1992; Taylor 1993), also influenced the social situations and social behavior of patients. However, an independent—even if modest—contribution by these factors to criminal behavior cannot be excluded. May the deinstitutionalization of patients have been important in this context? Deinstitutionalization indeed took place in Switzerland, but it was not complete, and patients were provided with alternatives. However, because they delay getting treatment—and often are noncompliant anyway—patients still are not treated sufficiently despite the availability of psychiatric services.

In sum, our results indicate that
the question of criminality among schizophrenia patients has to be considered less narrowly than it has been. Altogether, schizophrenia patients were not found to have criminal records more often than matched controls. However, they were found to be more frequently registered for particular types of crime further depending on the type or, perhaps, the stage of illness. These results were obtained with appropriate controls carefully matched for sociodemographic factors. Contrary to a previous assumption (Monahan and Steadman 1983), controlling for these factors did not cause a relationship between crime and mental disorder to disappear. Our findings confirm that mental illness helps explain some kinds of criminal behavior independently of sociodemographic variables (Link et al. 1992). However, these findings must be put in perspective. We should not forget that persons with mental disorders are responsible only for a small fraction of the crime and violence in society (Monahan 1993). Also, criminal acts performed by the mentally ill are not necessarily related to their mental disorders. Remitted psychotics can commit crimes for the same reasons as people without psychiatric histories—crimes for which they are just as responsible (Morissette 1986). Correspondingly, some of our patients were sentenced for their offenses long after their first psychiatric hospitalization.

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