

Mental Disorders and Criminal Behaviour

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Background. Using improved methods, findings of higher criminality in a psychiatric population were tested.

Method. An unselected sample of 1265 Swiss in-patients and a matched control group drawn from the general population were studied. Detailed accounts of conviction records served as a measure of criminal behaviour.

Results. Apart from traffic law violations by men, and violent crimes and sexual offences by women, patients were more frequently registered in all crime categories. However, there were significant differences between the diagnostic groups. Alcoholics and drug users of both sexes had a significantly higher criminality rate. A higher rate was also found among female, but not male, patients suffering from schizophrenia or related disorders and other, mostly organic, disorders.

Conclusions. Alcoholism and drug abuse contribute significantly to criminal behaviour, independent of sociodemographic factors; however, with a few exceptions, mental disorders such as schizophrenia and affective disorders do not contribute to criminal behaviour.

The criminality rate among mental patients was reported to have increased after 1965 (Rabkin, 1979). For example, from 1946 to 1948 15% of male psychiatric in-patients had pre-admission police records; this percentage rose to 32% in 1968 and to 40% in 1975 (Melick *et al.*, 1979). In earlier studies, the criminality rate of mentally ill patients was found to be the same as or even lower than that in the general population (Pollock, 1938; Cohen & Freeman, 1945). However, later studies showed a higher criminality rate of mentally ill patients than in the general population (Zitrin *et al.*, 1976; Cocozza *et al.*, 1978; Sosowsky, 1978; Steadman & Cocozza, 1978; McFarland *et al.*, 1989), although these findings have been questioned (Durbín *et al.*, 1977; Cook, 1983). The presumed increase in the criminality rate of the psychiatric population has been considered to be a consequence of deinstitutionalisation (Davis, 1992) and the criminalisation of the mentally ill (Borzecki & Wormith, 1985), who are transferred into the penal system instead of being cared for by the mental health system (Abram & Teplin, 1991). Indeed, a high proportion of mental disorder has been found among prisoners and penitentiary inmates (Bland *et al.*, 1990; Côté & Hodgins, 1990). In Britain, 37% of the male prison population have been diagnosed as suffering from a psychiatric disorder, of whom only 2% have been diagnosed as psychotic (Gunn *et al.*, 1991).

However, studies of the relationship between mental disorder and offending are fraught with methodological difficulties (Wessely & Taylor, 1991). The majority of these investigations have been conducted in the US in the highly selected

populations of penal establishments or special court clinics (Prins, 1990). Those studies that investigated the prevalence of criminality in former psychiatric in-patients or similar groups were performed without appropriate control subjects; yet the mentally ill of the US mental hospital system are not representative of the normal population with which they have regularly been compared. The inclusion of appropriate controls is indispensable; factors such as sex, age, marital status, place of living, race and social class (Guze, 1976; Braithwaite, 1981; Lynch, 1988) do affect crime rates, even though they do not fully explain the association between mental patient status and dangerous behaviour (Link *et al.*, 1992).

We have investigated the prevalence of criminality in an unselected sample of psychiatric in-patients in Switzerland. The population from which the subjects were recruited was racially homogeneous. A control group, drawn from the general population, was included in the study and matched with the patients with regard to sex, age, marital status, social class and size of community of residence. A full account of convictions served as a measure of criminal behaviour. To our knowledge, no study using the same method has ever been performed.

Method

The study was performed at the Psychiatric University Hospital of Berne, which provides primary in-patient care for all residents of the catchment area. No patient requiring hospitalisation can be refused and all diagnostic categories are admitted. All patients hospitalised in 1987 were included in the study, who

Table 1
Demographic characteristics of 1265 psychiatric patients included in the study by sex. Percentages in parentheses

	Males	Females
Sex	687 (54)	578 (46)
Age (years)		
mean	39.4	43.8
s.d.	15.1	16.8
Marital status		
single	460 (67)	321 (56)
married	152 (22)	142 (25)
divorced	69 (10)	85 (15)
widowed	6 (1)	30 (5)
Social class		
1. High/upper middle	23 (3)	22 (4)
2. Middle	34 (5)	47 (8)
3. Lower middle	150 (22)	155 (27)
4. Upper low	289 (42)	215 (37)
5. Low	191 (28)	139 (24)
Community size (inhabitants)		
< 1000	46 (7)	36 (6)
1000–2999	102 (15)	69 (12)
3000–9999	106 (15)	77 (13)
10 000–99 999	176 (26)	145 (25)
≥ 100 000	257 (37)	251 (43)

fulfilled the following criteria: 18–78 years old at the time of data collection; to our knowledge, still living at the end of 1989; basic demographic data available in the clinical charts making identification of a control person possible. A total of 1438 patients were treated in the hospital in 1987; 118 patients did not fulfil the age criteria, matching was not possible for 46 patients (mostly housewives without indication of their husbands' profession, making social class classification impossible), no control person could be found for five patients, two patients were known to have died and two patients dropped out for other reasons. Thus, 1265 patients qualified for the study. Their characteristics in terms of sex, age, marital status, social class and the size of the community of residence are given in Table 1. Additionally, the principal ICD-9 (World Health Organization, 1978) hospital psychiatric diagnosis, the ICD-9 hospital diagnosis of a personality disorder (if appropriate) and the status of the patient as a chronic in-patient (index hospitalisation > 1 year) were extracted from the clinical charts.

The control group was selected from the general population of the catchment area. Registration of the population in Switzerland takes place at the level of local communities, which are highly independent. In order to obtain a matched control group, we contacted the local authorities in 55 of 101 communities of the catchment area; 42 of them 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, indicating the starting point for the search in the community file. The community file always contains a complete registration of all inhabitants whose permanent place of residence is in that particular community. Temporary absences, including long stays in hospitals or prisons, do not lead to exclusion from the file. Our collaborators from the respective local authorities were instructed individually until we were sure that the procedure was well understood, and this was followed by written instructions.

In searching for the appropriate control subjects, we were careful to recruit both patients and controls from communities of equal size. Subsequently, the collaborators examined the files for persons of the same sex, age (a difference of ± 2 years was permitted), marital status and occupational level, the latter to allow social class designation according to Moore & Kleining (1960) and modified by Dilling & Weyerer (1978). The best occupational level that was achieved was considered a variable independent of a possible later decline in social class (compare Monahan, 1993). In the city of Berne itself, we were provided with the coded list of all inhabitants containing the appropriate data and we searched for controls ourselves. As a result of our procedure, we obtained patient-control pairs of equal sex, age, marital status, social class and size of the community of residence. The names of the subjects were forwarded by us (in the case of the patients) and by the local authorities (in the case of the controls, whose names were not revealed to us) to the Swiss Central Criminal Records Department and the Division of Penal Control of the Canton of Berne. The procedure corresponds to the instructions of the Swiss Government for the treatment of personal data for scientific purposes (issued 16 March 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.

The most complete registration of individuals' criminal activity in Switzerland is held in the Swiss Central Criminal Record Department. All court convictions are recorded with the exception of some small fines and trivial offences. In addition, there is no compulsory registration for those under the age of 18 and no registration at all for those over the age of 80. The Division of Penal Control of the Canton of Berne registers convictions against the citizens of the Canton of Berne; here, offences

Table 2
Comparison of patients and control subjects with regard to different types of offences and prison sentence by sex. Percentages in parentheses

Criminal record	Males					Females				
	Patients n = 687	Controls n = 687	Significance χ^2	Odds ratio	99% CI	Patients n = 578	Controls n = 578	Significance χ^2	Odds ratio	99% CI
All crimes	348 (51)	245 (36)	30.87	1.85	1.39-2.46	123 (21)	36 (6)	53.93	4.07	2.43-6.81
Violent crimes	59 (9)	11 (2)	33.25	5.77	2.45-13.61	6 (1)	0 (0)	NS ¹		
Crimes against property	223 (33)	58 (8)	120.32	5.21	3.45-7.86	74 (13)	10 (2)	50.95	8.34	3.45-20.15
Sexual offences	38 (6)	6 (1)	22.56	6.65	2.12-20.79	0 (0)	0 (0)			
Violations of drug law	131 (19)	21 (3)	87.89	7.47	4.01-13.94	41 (7)	3 (1)	32.34	14.63	3.11-68.83
Violations of traffic law	222 (32)	189 (28)	NS	1.26	0.93-1.70	48 (8)	22 (4)	9.50	2.29	1.16-4.52
Other offences	180 (26)	77 (11)	49.80	2.81	1.92-4.13	40 (7)	6 (1)	24.65	7.09	2.27-22.12
Prison sentence	295 (43)	117 (17)	108.61	3.67	2.64-5.09	89 (15)	12 (2)	62.66	8.58	3.83-19.26
Unconditional prison sentence	257 (39)	59 (9)	159.49	6.36	4.24-9.54	35 (6)	5 (1)	21.78	7.39	2.13-25.55

1. Fisher's exact test, two-tailed.

resulting in fines not registered by the Swiss Central Criminal Record Department are recorded. Registration of some minor offences can be removed by the Central Department after 15 years and by the Division of the Canton after three years. Altogether, we were able to study life prevalence (starting at the age of 18) of all offences leading to prison sentences of more than three months duration, all offences committed in the last 15 years and leading to fines of at least 550 SFr or prison sentences, and all offences committed in the last three years and leading to fines of at least 200 SFr (80 SFr in the case of traffic law violations) or prison sentences. We were provided with data indicating the type and the number of offences and the type and number of sentences.

Statistical analysis utilised the χ^2 test (with continuity correction if appropriate) and Fisher's exact test for categorical variables. The non-parametric Wilcoxon two-sample test was used for continuous variables. Odds ratios and Pearson correlation coefficients were also calculated. As a multivariate procedure, a stepwise discriminant analysis was used to select the set of variables that best discriminated between patients with and without criminal records. The significance level for the variables to enter the model was 0.01. Only results yielding a *P* value of 0.01 or less were considered statistically significant in this study.

Results

The matched patient-control pairs were tested for concordance with regard to their criminal records: 823 (65%) of 1265 pairs were concordant. In 668

(81%) of these pairs both members had no criminal record and in 155 (19%) both members had a criminal record. The overall rate of concordance was significantly higher than chance ($\chi^2 = 49.68$, d.f. = 1, $P < 0.0001$). The importance of matching criteria was confirmed by the finding of a high proportion of controls with criminal records (36% of males and 6% of females) in comparison with the entire population of the Canton (15% of males and 2% of females) and, further, by a finding of significant negative relationships between criminal record and female sex, marital status 'married', higher social class and higher age. All of these variables exerted a protective influence in both patients and control subjects against various kinds of criminal behaviour.

The proportions of patients and control subjects with criminal records were compared separately for both sexes. The results are presented in Table 2, which indicates the overall rate of criminal behaviour (patients v. control subjects: 51% v. 36% in males; 21% v. 6% in females) as well as infringements of particular laws. Note that individual subjects were convicted of more than one type of offence. With the exceptions of traffic law violations by males and violent crimes and sexual offences by females (no sexual offences by females were registered), the proportion of subjects criminally registered was significantly higher among the patients compared with the controls across all types of crime. Correspondingly, a higher proportion of patients was sentenced and unconditionally sentenced to prison.

The rate of recidivism, in terms of the number of criminal acts registered in subjects with criminal

Table 3
Proportions of male and female patients with criminal records by diagnosis and status as chronic in-patient. Percentages in parentheses

	Male patients			Female patients		
	Total <i>n</i> = 687	Proportion of subjects with criminal record in each group	Significance	Total <i>n</i> = 578	Proportion of subjects with criminal record in each group	Significance
Schizophrenia and related disorders (ICD-9, 295, 297, 298)	212 (31)	73 (34)		226 (39)	32 (14)	
Affective disorders (ICD-9, 296, 298.0, 300.4, 301.1, 309.0/1, 311)	77 (11)	40 (52)	$\chi^2 = 103.94$ d.f. = 3 $P < 0.0001$	116 (20)	10 (9)	$\chi^2 = 101.65$ d.f. = 3 $P < 0.0001$
Alcoholism and drug use disorders (ICD-9, 303, 304, 305)	237 (34)	181 (76)		110 (19)	62 (56)	
Other disorders (organic disorders, oligophrenia, etc.)	161 (23)	54 (34)		126 (22)	19 (15)	
(Additional) diagnosis of personality disorder	Yes 203 (30) No 484 (70)	138 (68) 210 (43)	$\chi^2 = 33.62$ $P < 0.0001$	141 (24) 437 (76)	42 (30) 81 (19)	$\chi^2 = 7.40$ $P = 0.007$
Index-hospitalisation ≥ 1 year	Yes 119 (17) No 568 (83)	21 (18) 327 (58)	$\chi^2 = 61.15$ $P < 0.0001$	117 (20) 461 (80)	6 (5) 117 (25)	$\chi^2 = 21.65$ $P < 0.0001$

Table 4
Proportions of patients with criminal records (all offences and violent offences) by sex and by diagnosis in comparison with matched controls. Percentages in parentheses

	Males					Females				
	Patients	Controls	Significance	Odds ratio	99% CI	Patients	Controls	Significance	Odds ratio	99% CI
			χ^2					χ^2		
				<i>P</i>					<i>P</i>	
Schizophrenia and related disorders	212 (100)	212 (100)				226 (100)	226 (100)			
all crimes	73 (34)	79 (37)	NS	0.88	0.52-1.49	32 (14)	14 (6)	6.99	0.008	1.05-5.93
violent crimes	9 (4)	3 (1)	NS	3.09	0.54-17.52	1 (0)	0 (0)	NS ¹		
Affective disorders	77 (100)	77 (100)				116 (100)	116 (100)			
all crimes	40 (52)	26 (34)	NS	2.12	0.90-4.98	10 (9)	7 (6)	NS	1.47	0.39-5.48
violent crimes	8 (10)	1 (1)	NS ¹	8.81	0.55-139.98	1 (1)	0 (0)	NS ¹		
Alcoholism and drug use disorder	237 (100)	237 (100)				110 (100)	110 (100)			
all crimes	181 (76)	93 (39)	65.47	<0.0001	2.97-8.43	62 (56)	9 (8)	56.23	<0.0001	5.21-40.35
violent crimes	29 (12)	5 (2)	16.76	<0.0001	1.81-23.07	1 (1)	0 (0)	NS ¹		
Other disorders	161 (100)	161 (100)				126 (100)	126 (100)			
all crimes	54 (34)	47 (29)	NS	1.22	0.66-2.27	19 (15)	6 (5)	6.39	0.011	1.01-12.44
violent crimes	13 (8)	2 (1)	6.99	0.008	0.97-50.50	3 (2)	0 (0)	NS ¹		

1. Fisher's exact test, two-tailed.

records, was significantly higher in the patients compared with the controls. The means were 8.5 (s.d. 9.8) for the male patients and 3.8 (s.d. 4.6) for the male controls ($Z = -9.35, P < 0.0001$); 3.6 (s.d. 3.2) for the female patients and 1.7 (s.d. 1.6) for the female controls ($Z = -3.95, P < 0.0001$). Accordingly, the number of sentences per registered subject was nearly twice as high in the patients compared with the controls, the difference again being highly significant: 5.8 (s.d. 5.7) v. 3.0 (s.d. 3.3) for males ($Z = -8.97, P < 0.0001$) and 2.8 (s.d. 2.3) v. 1.3 (s.d. 0.7) for females ($Z = -4.92, P < 0.0001$).

As Table 3 demonstrates, there are significant differences in the proportion of patients with criminal records in individual diagnostic groups. In both sexes, the proportion of registered patients was highest among those suffering from alcoholism or drug use. Also, the additional diagnosis of personality disorder significantly increased the proportion of criminally registered patients. In contrast, the proportion of patients with criminal records was smaller in those classified as chronic in-patients at the time of the study. Significant positive correlations were found between alcoholism/drug use and personality disorder ($r = 0.31$ in males, $r = 0.15$ in females); significant negative correlations were found between alcoholism/drug use and in-patient chronicity ($r = -0.31$ in males; $r = -0.24$ in females).

In Table 4, patients in individual diagnostic groups are compared with their matched controls with regard to criminal registration and violent offences. Significant differences were found in alcoholics and drug abusers of both sexes and in female patients suffering from schizophrenia or related disorders. Within the group 'alcoholism/drug use disorder', in both sexes, more drug-abusing than alcohol-abusing patients had been criminally registered (males: 103 of 117 (88%) v. 78 of 120 (65%), $\chi^2 = 16.22, d.f. = 1, P < 0.0001$; females: 45 of 65 (69%) v. 17 of 45 (38%); $\chi^2 = 9.46, d.f. = 1, P = 0.002$). Female

patients suffering from other (mostly organic) disorders were criminally registered more frequently, even though absolute numbers were relatively small. There was also some tendency ($P = 0.034$) for male patients with affective disorders to be criminally registered more often. More male patients suffering from alcoholism/drug use and other (mostly organic) disorders had a criminal record because of violent offences.

With the help of stepwise discriminant analysis, those variables were sought that would best discriminate between patients with and without criminal registration. Demographic variables (matching criteria), diagnostic variables and in-patient chronicity were included. The results for patients of both sexes are given in Table 5. The proportion of the explained variance seems to be rather modest, but the discriminatory power of the model is not increased by lowering the entry threshold and including additional variables. In males, the sensitivity of the model is 74.4, the specificity 86.1; the corresponding numbers for females are 82.9 and 76.0, respectively. The variables 'alcoholism/drug use disorder' and 'age' always appear first when investigating infringements of particular laws in both sexes. In female patients, the sensitivity of the model using these two variables is 100.0 with regard to crimes against property and violations of drug law, and 98.0 with regard to violations of traffic law.

Discussion

There is no ideal index for studying criminal behaviour in general and in mentally ill patients in particular. The rate of arrest, although frequently used, may not be the most appropriate index: within the same category of offence, the mentally disordered have higher arrest rates than non-mentally ill persons (Teplin, 1984), being disproportionately liable to detection and arrest after their offence (Robertson,

Table 5
Results of stepwise discriminant analysis. Variables best discriminating between male and female patients with and without criminal records

Variable entered	Partial R^2	F	P	Average squared canonical correlation	P
<i>Male patients</i>					
Diagnosis of alcoholism or drug use disorder	0.139	110.90	0.0001	0.139	0.0001
Age	0.094	70.60	0.0001	0.220	0.0001
(Additional) diagnosis of personality disorder	0.018	12.66	0.0004	0.234	0.0001
Marital status: divorced	0.014	9.62	0.002	0.245	0.0001
<i>Female patients</i>					
Diagnosis of alcoholism or drug use disorder	0.173	120.24	0.0001	0.173	0.0001
Age	0.067	41.11	0.0001	0.228	0.0001

1988). On the other hand, some trivial charges may be dropped in the case of the mentally ill (Johnstone *et al*, 1991), and violent behaviour with mental abnormality usually does not lead to an arrest (Lagos *et al*, 1977; Humphreys *et al*, 1992). However, we do not know how frequently charges are also dropped in the case of mentally healthy persons. In any case, criminal activity is finally only determined by a court (Rabkin, 1979). Convictions were used as the index of 'real' criminality in this study. Swiss law does not include the categories of 'incompetent to stand trial' or 'not guilty by reason of insanity'; all (and especially more serious) offences are judged by the court, which may rule for psychiatric measures instead of a prison sentence. These measures are also registered.

We compared the carefully matched groups of patients and controls; the importance of matching was confirmed by the higher criminality rate in our controls compared with the general population and the higher than chance concordance within the pairs. Higher proportions of patients of both sexes were registered/convicted for a higher number of total offences and offences within the individual crime categories. Men with mental disorders were 1.8 times more likely to have been convicted of a criminal offence and 5.8 times more likely to have been convicted of a violent crime. Women with mental disorders were 4.1 times more likely to have been convicted of a criminal offence, but they were no more likely than controls to have committed violent crimes. Thus, in correspondence with other studies that used different methods (Hodgins, 1992; Link *et al*, 1992), the mentally disordered people in our investigation have been found to be more criminal than the matched control population. The patients were also more frequently sentenced, more frequently sentenced to prison and more frequently sentenced unconditionally. Therefore, their offences probably were not always of a trivial nature.

The mentally disordered people were defined as individuals having been hospitalised at least once for mental problems. There might be a selection bias in comparing hospitalised patients with community controls. Unfortunately, there is no community-based psychiatric register in Switzerland. The majority of the more seriously ill will have been hospitalised sometime in the course of their illness; for example, all 51 schizophrenics who contacted the psychiatric out-patient service in Berne during a 1-year period had been hospitalised in the past (Hoffmann, 1994). Some mentally ill persons could have been included in our control group. The majority of our patients were rehospitalised; could this fact, indicating severity and chronicity, have influenced the results?

We examined separately groups of schizophrenic, affective disordered and alcohol-dependent men. In none of these groups was there a relationship between criminal record and number of psychiatric hospitalisations. Schizophrenic, but not other, men without criminal records spent more total time in psychiatric hospitals; thus, they were intensively treated and had less opportunity to become criminal. This may have influenced our findings; those who currently have psychotic symptoms are more likely to engage in violent/illegal behaviour (Link *et al*, 1992). There are always difficulties in accurately assessing the relationship between offending and mental abnormality and "no single study will ever overcome all the methodological problems" (Wessely & Taylor, 1991).

Significant differences in the criminality rate between patients in different diagnostic categories were found. However, the differences between the mentally ill in the narrower sense of the word (schizophrenia and related disorders, schizophrenic patients representing 74% of this group) and the corresponding controls were only partially significant, the criminality rate in schizophrenic females (but not schizophrenic males) being enhanced. This corresponds with previous findings (Lindqvist & Allebeck, 1990). Importantly, schizophrenic patients were not found to be significantly more violent, which contradicts previous, admittedly rough, estimates by Häfner & Böker (1982). As indicated, longer hospitalisations and a prudent discharge policy may have played a role here. Partial deinstitutionalisation has taken place in Switzerland; however, patients have been provided with alternatives and there are only a few homeless mentally ill in the country. Homeless former psychiatric in-patients were found to be frequently criminal (Gelberg *et al*, 1988).

There was some, although only marginal, tendency for males with affective disorders to have a higher criminal rate than controls. The high percentage of these criminally registered males (52%), primarily due to a high frequency of traffic law violations (in 34%) and crimes against property (in 25%), is surprising because the frequency of affective disorders in unselected criminal populations is only 0.02–0.6%, and in criminal populations selected for psychiatric evaluation does not exceed 13% (Good, 1978). Consideration of the full details of criminal registration in our study may explain the difference. Our results further demonstrate that males with organic disorders may become violent, whereas females of this group were basically involved in crimes against property (10% v. 0% in controls).

The most pronounced difference between patients and control subjects is in the group with alcoholism and drug use disorders, with 76% of male and 56% of female patients having been criminally registered. Alcohol- and drug-abusing men were 5 times, and alcohol- and drug-abusing women 14.5 times more likely than control subjects to be criminally registered. Even higher odds ratios have recently been found in substance-abusing/dependent male and female probands by Hodgins (1992). With the exception of violent crimes and sexual offences in women, we found significant differences in all types of crime for both sexes in this diagnostic group, the criminal rate of drug abusers exceeding that of alcoholics. In the multivariate analysis, the diagnosis of alcoholism/drug use disorder proved to be the most powerful variable to discriminate between patients with and without criminal records. The importance of alcohol/drug abuse/dependence for criminal behaviour has been well established in studies of different samples of prisoners (Faulk, 1976; Guze, 1976; Lightfoot & Hodgins, 1988; Bland *et al*, 1990; Côté & Hodgins, 1990; DeJong *et al*, 1992) including geriatric (Rosner *et al*, 1985a) and female (Rosner *et al*, 1985b) offenders. The same applies to the diagnosis of personality disorder (Guze, 1976; Bland *et al*, 1990; Côté & Hodgins, 1990). Both groups of disorders, alone or comorbid with severe mental illness (Abram & Teplin, 1991), are frequent among criminal populations and our results agree with these findings.

It has been argued that when appropriate controls for sociodemographic factors are applied the relations between crime and mental disorder tend to disappear (Monahan & Steadman, 1983). We did apply appropriate controls for sociodemographic factors and no, or only marginal, relation to crime could be demonstrated in 'true' mental illness such as schizophrenia or affective disorders. In contrast, our results prove that the diagnosis of alcohol/drug abuse/dependence (and, possibly, of comorbid personality disorder) make an independent contribution with regard to criminal behaviour. Thus, the successful therapy of these disorders may contribute to the reduction of the criminality rate.

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