British Journal of Psychiatry (1990), **157**, 345–350

Schizophrenia and Crime
A Longitudinal Follow-up of 644 Schizophrenics in Stockholm

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To compare the crime rate of schizophrenics with that of the general population, data from the Central Swedish Police Register on 790 schizophrenic patients discharged from hospitals in Stockholm in 1971 was analysed for the period 1972–86. Relative risk of criminal offence was assessed by comparing the observed number of offences committed with the expected number (estimated from official statistics). The crime rate among male schizophrenics was almost the same as that in the general male population, whereas among females it was twice that of the general female population. The rate of violent offences was, however, four times higher among the schizophrenics. The violence recorded was almost exclusively of minor severity.

There is some uneasiness concerning the increasing crime rates in Sweden (Wikström, 1985), as well as the ongoing de-institutionalisation of the mentally ill. The role of psychiatry in predicting and preventing criminal behaviour among the mentally ill has also been questioned (Christie, 1982).

Few authors have investigated the general pattern of crime among the mentally ill compared with that of 'normal' subjects. Eitinger (1978) concluded from a study of 179 mentally ill offenders in Norway that there are two main categories of offenders: those who commit violent acts in acute, psychotic paranoid states in response to particular situations, and those who commit minor criminal offences to the same extent as an equivalent underprivileged non-psychotic population. Wiersma (1966), on the basis of a study in the Netherlands, claimed that individuals with schizophrenia contribute very little to crime in general, and Monahan & Steadman (1983) in the USA found that 'true' rates of crime are independent of mental disorder when allowing for demographic factors and certain life-history factors.

Using a population-based register of criminal offences, we were able to follow longitudinally a cohort of patients with schizophrenia, discharged from hospitals in Stockholm in 1971. To our knowledge, there has previously been no such study of crime among schizophrenics or other mentally ill people. The aims of the present study were:

(1) to find out if patients with schizophrenia commit crimes more frequently than the general population, and if so, to what extent;
(2) to describe the types of crime committed by schizophrenic patients, compared with the general crime pattern in Sweden.

Method

Study population

From the Stockholm county in-patient register we identified all patients ($n = 790$) born between 1920 and 1959, and with a diagnosis of schizophrenia (diagnostic code 295 according to ICD–8; World Health Organization, 1967) who were discharged during 1971. The register covers all psychiatric clinics and mental hospitals in Stockholm county, and thus provided a population-based cohort of schizophrenics for this area. The selection procedure, as well as a 10-year mortality follow-up, has been described previously (Allebeck & Wistedt, 1986). For the purposes of the present study, death records up to the end of 1985 were obtained, giving a total number of 142 deaths in the cohort during the 14-year follow-up period. These individuals had to be excluded from the study since information on deceased are effaced from the register of criminal records.

The validity of the diagnosis in the original cohort was assessed by Kristjansson *et al* (1987), who found that at least 85% of the cases complied with the DSM-III (American Psychiatric Association, 1980) criteria for schizophrenia. Four individuals identified in the present study were excluded since their medical records revealed psychosis other than schizophrenia. The number of schizophrenics studied here was thus 644.

Criminal records

The Swedish Central Police Board has a special register, The Central Police Register, which contains information on verdicts as well as on cases which are not prosecuted because of, for example, age or mental abnormality (*The Swedish Code of Judicial Procedure*, 1968).

Records of the register are kept for at least five years for offenders who are fined, and a minimum of ten years if a more severe sentence is given. Information is available from 1945 onwards in cases of repetitive criminal behaviour and felonies. Offences of *The Penal Code of Sweden* (1972) which are restricted to punishment by fines are not registered.

https://doi.org/10.1192/bjp.157.3.345 Published online by Cambridge University Press

Follow-up and statistical analysis

Since the in-patient register and the Central Swedish Police Register are organised in terms of personal numbers, unique to every citizen, the records of both registers could be automatically linked at an individual level. Permission for this was granted by the Data Inspection Board and the Faculty Research Ethics Committee, University of Umeå.

Between 1972 and 1986, the Central Swedish Police Register was thus searched for information about the 644 schizophrenic patients. Only offences resulting in a verdict or a decision not to prosecute because of mental abnormality were included. Non-violent offences were analysed only for the period 1976–1986 since these crimes – in contrast to violent offences – more often result merely in fine penalties and are thus stored in the register for a shorter period of time.

The criminal activity of schizophrenics was compared with that of the general population using the number of 'principal offences' committed. The 'principal offence' for each person is that committed during one year which is linked to the most severe penalty. The number of principal offences in the two groups was analysed by indirect standardisation (Armitage, 1987), using the sex-specific and age-specific (10-year interval) rates of offence in the general Swedish population. The expected number of principal offences was obtained by multiplying the number of years of follow-up of each patient in the cohort by the yearly incidence of principal offences in the national population (Yearbook of Legal Statistics, 1980). The expected number of offences thus obtained among the schizophrenics was then compared with the observed number by computing the ratio of the observed : expected number of offences. The figure thus obtained corresponds to the relative risk of criminal offence among schizophrenics compared with the general population. Confidence intervals of 95% were calculated according to the test-based method described by Miettinen (1985).

Non-prosecuted danger-stamped psychiatric patients ('0-cases')

The term '0-cases' is applied to psychiatric in-patients who commit an act directed against the personal safety of another, but for which no prosecution is carried out. Classification as an '0-case' is determined by the chief psychiatrist at a hospital and/or the discharge committee and results in restrictions of leave and discharge. According to the statutes, most crimes against other people (physical or verbal), sexual offences, robbery and arson should be included as potential '0-cases' (Ekblom, 1970). However, in practice, the more severe violence by in-patients is generally reported to the police for investigation and prosecution. All '0-cases' are meant to be registered in the Central Swedish Police Register. Twelve such cases were identified, but omitted from the study since they were not judicially categorised. They will, however, be analysed in a future paper, where the violent offenders of the cohort are further examined.

TABLE I

Sex and age distribution of 644 patients with schizophrenia, discharged from hospitals in Stockholm county during 1971

Age: years[1]	*Sex*		*Total*
	Males n *(%)*	*Females* n *(%)*	n
12–20	15 (60)	10 (40)	25
21–29	121 (62)	75 (38)	196
30–39	96 (47)	109 (53)	205
40–51	98 (45)	120 (55)	218
Total	330 (51)	314 (49)	644

1. Age on January 1 1972.

Results

Incidence of criminal offence

The age and sex distribution of the 644 individuals is shown in Table I. Among these, 45 men and 9 women were responsible for 164 valid indictments between 1976–1986. Table II shows the relative risk of criminal offence among the schizophrenics compared with that of the general population. The crime rate among women was approximately twice the expected value whereas among men it was virtually the same as that of the general male population.

Figure 1 shows, for example, that in the age group 50–59 years, the number of principal offences committed by female schizophrenics was similar to the expected number in the female standard population. However, male schizophrenics in this age group had a crime rate that was more than twice that in the general male population.

Recidivism, defined as reconviction within five years (Yearbook of Legal Statistics, 1980), was similar among the schizophrenic men (22%), and the general male population (25%). Female schizophrenics had almost a doubled recidivism rate (23%) as compared with the general female population (14%).

Types of crime

Violent offences

Four of the 32 violent offenders were women (13%). The female contribution in national figures of corresponding crimes was between 5 and 10%. None of the women in the cohort committed two or more violent offences during the follow-up period, whereas seven men received two verdicts of violence, and three men were guilty of three violent offences each.

Assault, unlawful threat and threat or violence against officials constituted 95% of all violent crimes. Assault represented the most common offence and occurred in 20 instances (Table III). The most serious crime recorded was a charge of aggravated assault.

The group studied in the present investigation committed almost four times as many violent offences as the general

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TABLE II
Observed and expected numbers of any and violent principal offences[1] (crimes) among 644 patients with schizophrenia

	No. of observed cases	*No. of expected cases*	*Ratio observed/ expected cases*	*95% confidence interval*
Any crime (1976–1986)				
men	75	69.5	1.2	0.7–2.1
women	17	7.3	2.2	1.5–3.6
Violent crimes (1972–1986) total	43	11.0	3.9	3.0–5.1
against life and health	20	7.4	2.7	1.8–4.1
against liberty and peace	8	1.4	5.7	3.1–10.5
against public order	15	2.3	6.5	4.2–10.0

1. Principal offence – the offence during one year which is linked to the most severe penalty.

population, this varying with the type of crime and age (Table II; Fig. 2). However, statistical comparisons between these subgroups must be interpreted with caution, and calculations regarding sex distribution versus type of crime was not performed because of the small numbers.

Non-violent offences

Table IV shows the main crime categories and the most frequent offences committed. Five women and 42 men were responsible for 131 valid indictments. Theft, petty theft, fraud and fraudulent conduct constituted half of all instances of non-violent crimes. Included in the group 'other offences' were four crimes of alcohol or drug use (drunk and disorderly behaviour, driving intemperated, drunken driving, breaking the Narcotic Drug Law), and three crimes against morals (carnal abuse of children and indecent conduct).

TABLE III
Classification and number of violent offences among 644 patients with schizophrenia

Crime typology with corresponding chapter (and passage) in the Penal Code of Sweden	*No. of principal offences[1]*
Chapter 3 (1–11§): crimes against life and health	
aggravated assault	1
assault	15
petty assault	4
Chapter 4 (1–5§): crimes against liberty and peace	
unlawful deprivation of liberty	1
unlawful threat	7
Chapter 17 (1,16§): crimes against public order	
violence against officials	6
violence against officials (petty)	5
attempt of violence against officials (petty)	1
threat against officials	3
All violent crimes	43

1. Principal offence – the offence during one year which is linked to the most severe penalty.

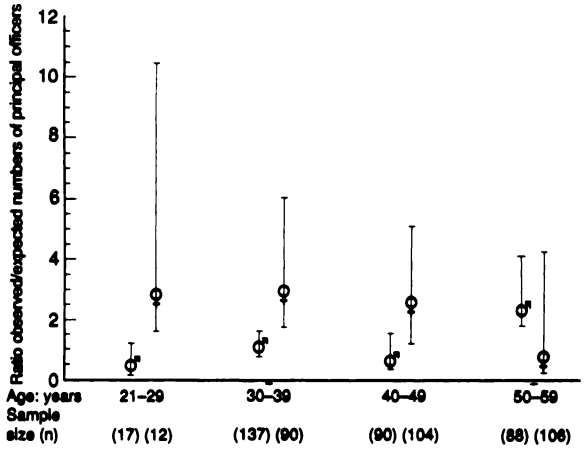


FIG. 1 Sex and age distribution of the ratio of observed : expected numbers of principal offences among 644 schizophrenics, 1976–1986 (age and sample size of the cohort taken from January 1 1980). Mean values of ratio shown by ♀ (women) and ♂ (men); 95% confidence interval marked by vertical lines.

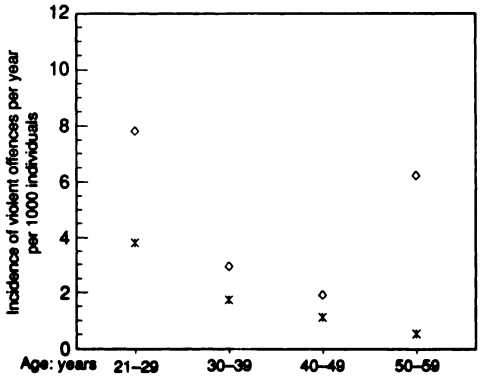


FIG. 2. The age-specific incidence per 1000 people per year (1972–1985) of the 42 schizophrenic patients (◇) who were responsible for assault, unlawful threat, and threat or violence against officials compared with the age-specific incidence of violence in offences in the general population (*) in 1978.

https://doi.org/10.1192/bjp.157.3.345 Published online by Cambridge University Press

TABLE IV
Classification and number of non-violent offences among 644 patients with schizophrenia

Crime typology with corresponding chapter (and passage) in the Penal Code of Sweden	*No. of valid indictments*
Chapter 8: theft, robbery and other crimes of stealing	
(1§) theft	12
(2§) petty theft	24
(5§) robbery	1
Chapter 9: fraud and other dishonesty	
(1§) fraud	11
(2§) fraudulent conduct	18
Chapter 12: crimes inflicting damage	
(1§) inflicting damage	13
Chapter 17: crimes against public order	
(4§) violent resistance	6
Other offences	46
All non-violent crimes	131

Discussion

The main results of this study were that male schizophrenics did not, in general, commit more criminal offences than that expected in the general male population. The age distribution of male schizophrenic offenders was almost inverted as compared with findings in a study of custodially remanded male schizophrenic prisoners from the London area (Taylor & Parrott, 1988). However, different selection procedures and the small subgroups of this series may well be responsible for this discrepancy. Female schizophrenics had a criminal rate twice that of the general female population, although the actual numbers were small.

Violent crimes were four times more frequent among schizophrenics than 'normals'. This finding supports the conclusions of a study on remanded prisoners in England, in which schizophrenics were reported to have an increased risk of committing violent offences (Taylor & Gunn, 1984).

We have found no previous study with such a design that permits strict comparison with our findings, although a number of authors have investigated the question of dangerousness among the mentally ill as a group (e.g. Rappeport & Lassen, 1965; Rubin, 1972; Lagos *et al*, 1977; Teplin, 1985) or among specific psychiatric categories (e.g. Benezech *et al*, 1980; Craig, 1982, Häfner & Böker, 1982). Some methodological problems of such studies have been scrutinised by Krakowski *et al* (1986). In another critical review of 12 American papers on the subject, the author asserted ". . . we must be circumspect in imputing any special degree of criminality to the discharged mental patient" (Cohen, 1980). Nevertheless, several authors have reported that paranoid schizophrenia is correlated with an increased risk of violent behaviour (Tardiff & Sweillam, 1980; Addad *et al*, 1981; Krakowski *et al*, 1986). However, it is not self-evident that a mental illness *per se* creates socially illegitimate behaviour (Taylor, 1982), although it has been argued that overt psychotic symptoms are associated with risk for violent conduct (Rossi *et al*, 1986). Personality traits may also be a relevant factor for crime (Blackburn, 1968; Virkkunen, 1974*b*); the role of alcohol in aggressive behaviour is still disputed (Collins, 1982; Heath, 1983); and situational factors, including the often ambiguous interaction between the offender and the victim, are also not to be neglected (Wolfgang, 1958; Virkkunen 1974*a*,*b*; Planansky & Johnston, 1977).

Psychiatric personnel seem to perceive dangerousness in a systematic and rational manner (Segal *et al*, 1988; Mills, 1988). However, if discharged mental patients are denied appropriate social and medical support, criminal behaviour may ensue (Cohen, 1980). De-institutionalisation of the mentally ill therefore may have repercussions in terms of increase in violence by discharged and neglected mental patients (Gottlieb *et al*, 1987; Tanay, 1987; Weller & Weller, 1988).

From Swedish official statistics (1980) it was found that 14 000 individuals were sentenced to imprisonment while 800 were sentenced to social or psychiatric treatment. Thus, most criminals have few, if any, connections with psychiatry, and it is therefore dubious whether psychiatrists should accept the role of being society's safeguards against deviant behaviour, especially as 'normal' criminals are released without prior risk evaluation.

Society's legal actions against potentially dangerous individuals is not primarily a statistical or medical issue, but an ethical one. Two contradictory positions are recognised: the right of a mentally ill person not to be classed as a 'false positive' (Steadman, 1980), and the right of the public to protect itself against possibly harmful individuals (Walker, 1978).

The validity of the study

Since some socially well-adapted schizophrenics may well live independently of in-patient clinics, the in-patients studied here do not completely represent the schizophrenic population in this area. However, most schizophrenics are admitted to hospital at some stage during the course of their illness, and scrutiny of medical records showed that the patients in this cohort were in fact outside institutions during most

https://doi.org/10.1192/bjp.157.3.345 Published online by Cambridge University Press

of the follow-up time. A possible crime-reducing effect of staying in hospital, a result of supervision and medication, may influence the incidence of crime among mentally ill people (Binder *et al*, 1988). On the other hand, the intense and involuntary interaction in a psychiatric institution is liable to generate conflicts and unlawful behaviour (Ekblom, 1970).

The '0-cases' present a problem, since they could not be included in the analysis. However, the general population must have included some criminals who acted violently in custody, but do not appear on the register. Thus, although we might have missed some assaults committed by schizophrenics, the effects are at least partly balanced by a similar loss in the comparison group.

Since the Central Swedish Police Register does not cover all single and minor offences for more than five years, nor all crimes connected with more severe penalties than fines for more than ten years, some uncertainty remains as to what extent all offences are covered in our study. However, the crimes possibly missing are very minor ones and the numbers of reported cases and the ratio of solved cases can be assumed to be even lower among these crime categories than in the case of serious offences. Nevertheless, there is still uncertainty about how far the true incidence of petty offences is reflected in the official statistics.

In summary, there are factors that lead to an over-reporting as well as an under-reporting of crime among the mentally ill. On balance, we do not believe that these uncertainties would lead to a systematic bias in one direction, which might invalidate our findings.

We did not statistically adjust for residency and socio-economic status, since such information was not available in the records. However, we did find that arrest rate of violent offenders in Stockholm (i.e. where our study was based) was 1.9 times higher than that of the country as a whole. We might thus have overestimated the excess crime among schizophrenics, since our comparison group probably had a lower general crime rate than a corresponding group in Stockholm.

As regards social factors, it is well known that chronically ill patients with impaired community functioning tend to end up among the lower socio-economic strata of the population where criminal behaviour is more prevalent. If this is part of the disease pattern, it is doubtful whether it should be controlled for in the analysis. This could mask the real effects of mental illness, of which 'social drift' is only one aspect.

In spite of these shortcomings, we do feel that a population-based follow-up of a diagnostically homogeneous group of patients, which identifies offences through links with a police register, is valuable in describing the pattern of criminal offences of the mentally ill, and in quantifying the problem as compared with the general population.

Conclusions

The main findings of our study were that the rate of criminal offence among male schizophrenics was, in general, almost the same as in the general population, whereas among females it was twice that of the general population. The rate of violent offence was, however, four times higher among schizophrenics, but taking into account the problems of validity discussed above, this figure might be slightly overestimated. As in the general population, males dominate as offenders. Although the rate of offences among schizophrenics thus seems higher than in the general population, the ethical dilemma remains: how many and which schizophrenic patients should be retained on the basis of possible future criminal conduct?

Acknowledgements

This work was supported by the Bank of Sweden Tercentenary Foundation. The authors also acknowledge the expert secretarial assistance of Ms Lolomai Örnehult.

References

ADDAD, M., BENEZECH, M., BOURGEOIS, M., *et al* (1981) Criminal acts among schizophrenics in French mental hospitals. *Journal of Nervous and Mental Disease*, **169**, 289–293.

ALLEBECK, P. & WISTEDT, B. (1986) Mortality in schizophrenia. *Archives of General Psychiatry*, **43**, 650–653.

AMERICAN PSYCHIATRIC ASSOCIATION (1980) *Diagnostic and Statistical Manual of Mental Disorders* (DSM–III) (3rd edn). Washington, DC: APA.

ARMITAGE, P. (1987) *Statistical Methods in Medical Research*. Oxford: Blackwell Scientific.

BENEZECH, M., BOURGEOIS, M. & YESAVAGE, J. (1980) Violence in the mentally ill: a study of 547 patients at a French hospital for the criminally insane. *Journal of Nervous and Mental Disease*, **168**, 698–700.

BINDER, R. L. & MCNIEL, D. E. (1988) Effects of diagnosis and context on dangerousness. *American Journal of Psychiatry*, **145**, 728–732.

BLACKBURN, R. (1968) Emotionality, extraversion and aggression in paranoid and nonparanoid schizophrenic offenders. *British Journal of Psychiatry*, **115**, 1301–1302.

CHRISTIE, N. (1982) *Limits to pain*. Oxford, UK: Martin Robertson & Company.

COHEN, C. I. (1980) Crime among mental patients – a critical analysis. *Psychiatric Quarterly*, **52**, 100–107.

COLLINS, J. (1982) *Drinking and Crime*. New York: Tavistock.

CRAIG, T. J. (1982) An epidemiologic study of problems associated with violence among psychiatric inpatients. *American Journal of Psychiatry*. **139**, 1262–1266.

EITINGER, L. (1978) Psykoser og kriminalitet i Norge. *Nordisk Tidsskrift for Kriminalvidenskab*, **66**, 29–47.

https://doi.org/10.1192/bjp.157.3.345 Published online by Cambridge University Press

EKBLOM, B. (1970) Acts of violence by patients in mental hospitals. Dissertation. Uppsala: Scandinavian University Press.

GOTTLIEB, P., GABRIELSEN, G. & KRAMP, P. (1987) Psychotic homicides in Copenhagen from 1959 to 1983. *Acta Psychiatrica Scandinavica*, **76**, 285–292.

HEATH, D. B. (1983) Alcohol and aggression: a "missing link" in world-wide perspective. In *Alcohol, Drug Abuse and Aggression* (ed. E. Gottheil *et al*, pp. 89–103). Springfield, Illinois, USA: Charles C. Thomas.

HÄFNER, H. & BÖKER, W. (1982) *Crimes of Violence by Mentally Abnormal Offenders*. Cambridge: Cambridge University Press.

KRAKOWSKI, M., VOLAVKA, J. & BRIZER, D. (1986) Psychopathology and violence: a review of the literature. *Comprehensive Psychiatry*, **27**, 131–148.

KRISTJANSSON, E., ALLEBECK, P. & WISTEDT, B. (1987) Validity of the diagnosis schizophrenia in a psychiatric inpatient register. *Nordisk Psykiatrisk Tidsskrift*, **41**, 229–234.

LAGOS, J. M., PERLMUTTER, K. & SAEXINGER, H. (1977) Fear of the mentally ill: empirical support for the common man's response. *American Journal of Psychiatry*, **134**, 1134–1137.

MIETTINEN, O. F. (1985) *Theoretical Epidemiology*. New York: John Wiley & Sons.

MILLS, M. J. (1988) Civil commitment. The relationship between perceived dangerousness and mental illness. *Archives of General Psychiatry*, **45**, 770–772.

MONAHAN, J. & STEADMAN, H. J. (1983) Crime and mental disorder: an epidemiological approach. In *Crime and Justice: An Annual Review of Research*, vol. 4 (eds. M. Tonry & N. Morris), pp. 145–189. Chicago: The University of Chicago Press.

PLANANSKY, K. & JOHNSTON, R. (1977) Homicidal aggression in schizophrenic men. *Acta Psychiatrica Scandinavica*, **55**, 65–73.

RAPPEPORT, J. R. & LASSEN, G. (1965) Dangerousness-arrest rate comparisons of discharged patients and the general population. *American Journal of Psychiatry*, **121**, 776–783.

ROSSI, A. M., JACOBS, M., MONTELEONE, M., *et al* (1986) Characteristics of psychiatric patients who engage in assaultive or other fear-inducing behaviors. *Journal of Nervous and Mental Disease*, **174**, 154–160.

RUBIN, B. (1972) Prediction of dangerousness in mentally ill criminals. *Archives of General Psychiatry*, **27**, 397–407.

SEGAL, S. P., WATSON, M. A. GOLDFINGER, S. M., *et al* (1988) Civil commitment in the psychiatric emergency room: The assessment of dangerousness by emergency room clinicians. *Archives of General Psychiatry*, **45**, 748–752.

STEADMAN, H. J. (1980) The right not to be a false positive: problems in the application of the dangerousness standard. *Psychiatric Quarterly*, **52**, 84–99.

TANAY, E. (1987) Homicidal behavior in schizophrenics. *Journal of Forensic Sciences*, **32**, 1382–1388.

TARDIFF, K. & SWEILLAM, A. (1980) Assault, suicide, and mental illness. *Archives of General Psychiatry*, **37**, 164–169.

TAYLOR, P. (1982) Schizophrenia and crime. In *Abnormal Offenders, Delinquency, and the Criminal Justice System* (eds. J. Gunn & D. P. Farrington). New York: John Wiley & Sons.

TAYLOR, P. J. & GUNN, J. (1984) Violence and psychosis. I – Risk of violence among psychotic men. *British Medical Journal*, **288**, 1945–1949.

—— & PARROTT, J. M. (1988) Elderly offenders. A study of age-related factors among custodially remanded prisoners. *British Journal of Psychiatry*, **152**, 340–346.

TEPLIN, L. A. (1985) The criminality of the mentally ill: a dangerous misconception. *American Journal of Psychiatry*, **142**, 593–599.

The Penal Code of Sweden (1972) (original trans. Th. Sellin; amendment trans. J. L. Getz). NJ: South Hackensack.

The Swedish Code of Judicial Procedure, (1968) (trans. A. Bruzelius & R. B. Ginsburg). NJ: South Hackensack.

VIRKKUNEN, M. (1974a) Alcohol as a factor precipitating aggression and conflict behaviour leading to homicide. *British Journal of Addiction*, **69**, 149–154.

—— (1974*b*) Observations on violence in schizophrenia. *Acta Psychiatrica Scandinavica*, **50**, 145–151.

WALKER, N. (1978) Dangerous people. *International Journal of Law and Psychiatry*, **1**, 37–50.

WELLER, M. P. I. & WELLER, B. G. A. (1988) Crime and mental illness. *Medicine, Science and the Law*, **28**, 38–46.

WIERSMA, D. (1966) Crime and schizophrenics. *Excerpta Criminologica*, **6**, 169–181.

WIKSTRÖM, P.-O. H. (1985) Everyday violence in contemporary Sweden. *The National Council for Crime Prevention* (report no. 15). Stockholm: Liber Förlag.

WOLFGANG, M. E. (1958) *Patterns in Criminal Homicide*. Philadelphia: University of Pennsylvania Press.

WORLD HEALTH ORGANIZATION (1967) Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death, 1965 revision (8th edn) (ICD-8). Geneva: WHO.

YEARBOOK OF LEGAL STATISTICS (1980) *Official Statistics of Sweden*. Stockholm: The National Central Bureau of Statistics.

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