

Articles

Serious mental disorder in 23 000 prisoners: a systematic review of 62 surveys

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Summary

Background About 9 million people are imprisoned worldwide, but the number with serious mental disorders (psychosis, major depression, and antisocial personality disorder) is unknown. We did a systematic review of surveys on such disorders in general prison populations in western countries.

Methods We searched for psychiatric surveys that were based on interviews of unselected prison populations and included diagnoses of psychotic illnesses or major depression within the previous 6 months, or a history of any personality disorder. We did computer-assisted searches, scanned reference lists, searched journals, and corresponded with authors. We determined prevalence rates of serious mental disorders, sex, type of prisoner (detainee or sentenced inmate), and other characteristics.

Findings 62 surveys from 12 countries included 22 790 prisoners (mean age 29 years, 18 530 [81%] men, 2568 [26%] of 9776 were violent offenders). 3.7% of men (95% CI 3.3–4.1) had psychotic illnesses, 10% (9–11) major depression, and 65% (61–68) a personality disorder, including 47% (46–48) with antisocial personality disorder. 4.0% of women (3.2–5.1) had psychotic illnesses, 12% (11–14) major depression, and 42% (38–45) a personality disorder, including 21% (19–23) with antisocial personality disorder. Although there was substantial heterogeneity among studies (especially for antisocial personality disorder), only a small proportion was explained by differences in prevalence rates between detainees and sentenced inmates. Prisoners were several times more likely to have psychosis and major depression, and about ten times more likely to have antisocial personality disorder, than the general population.

Interpretation Worldwide, several million prisoners probably have serious mental disorders, but how well prison services are addressing these problems is not known.

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Introduction

About 9 million people are imprisoned worldwide, including 2 million in the USA and 70 000 in the UK.¹ Many psychiatric surveys have been done in prisons, but they have generally been small, have often included selected populations (such as prisoners referred to psychiatric services), and have not been assessed systematically. Indeed, three reviews included a total of only ten studies in general prison populations.^{2–4} More reliable estimates of the prevalence rates of serious mental disorders in prisoners, such as psychotic illnesses, major depression, and antisocial personality disorder should help inform public policy and prison health services. We have done a systematic review of psychiatric surveys of people in general prison populations in western countries (with results subdivided by disorder, sex, and type of prisoner).

Methods

We searched for studies of the prevalence of psychotic illnesses, major depression, or any personality disorder in general prison populations of western countries published between January, 1966, and January, 2001. We did computer-based searches (EMBASE, PsycINFO, MEDLINE, US National Criminal Justice Reference System Abstract Database), scanned relevant reference lists, searched forensic psychiatry and other relevant journals by hand, and discussed and corresponded with authors.^{5–71} We have not included diagnoses of substance abuse because prevalence in prisoners is likely to be substantially affected by various reporting and ascertainment biases. We used combinations of keywords relating to psychiatric illnesses (eg, mental*, psych*, depress*, personality) and to prisoners (eg, inmate, sentenced, remand, detainee, felon). Non-English articles were translated. We included surveys that did not sample prisoners referred for psychiatric assessment; that related diagnoses of psychotic illnesses or major depression to symptoms in the previous 6 months, or a diagnosis of personality disorder to lifelong behaviour; and involved diagnoses made by clinical examination or interviewers using diagnostic instruments (hence, surveys that used only self-report instruments, such as the depression component of the UK Office for National Statistics' study, were ineligible⁶⁰). Moreover, to reduce variability in diagnosis of personality disorders, we only included surveys in which validated instruments had been used. A few studies were not included because they were done in non-western populations (314 prisoners from Dubai, Kuwait, and Nigeria^{72–74}), reported substance abuse as the main diagnosis,⁷⁵ or used a hierarchy of exclusive diagnoses.⁷⁶

For every eligible study, we independently determined (with a fixed protocol supplemented by correspondence with authors; any discrepancies were resolved by further

review) geographical location, year of interview, number of prisoners interviewed, sampling method, type of prisoner (detainee *vs* sentenced inmate), response rate, diagnostic instruments and criteria, type of interviewer, number diagnosed with relevant disorders, mean age, proportion male, number charged with violent offences, and mean duration of imprisonment at time of interview. Psychotic illnesses included mainly schizophrenia but also schizophreniform disorder, manic episodes, and delusional disorder. Major depression included diagnoses of unipolar affective disorder (symptoms had to be present for at least 2 weeks). Any reported personality disorder was recorded, with particular emphasis given to antisocial (or dissocial) personality disorder because of its prognostic value and potential treatability.⁷⁷ If possible, results were tabulated separately by prisoners' status (ie, detainees [remand prisoners in the UK] *vs* sentenced inmates). Several studies did not provide separate results for detainees and sentenced prisoners; they were combined in analyses and called mixed studies.^{23–26,51,52,69}

As previously described,^{78,79} prevalence rates of various disorders were combined from different studies by direct summation of numerators and denominators (providing weighted averages), subdivided by sex and by prisoners' status. The results from smaller studies—those with less than 250 prisoners—were combined in figures 1–3 and when displaying the results from separate studies and calculating standard χ^2 tests of heterogeneity. Possible sources of heterogeneity were investigated by grouping studies according to potentially relevant characteristics and by χ^2 tests. To make some allowance for multiple comparisons, 99% CIs were used for individual studies (or aggregations of smaller studies), and 95% CIs for subtotals and overall totals.

Role of the funding source

The sponsors of the study had no role in study design, data collection, data analysis, data interpretation, or writing of the report.

Results

Study and baseline characteristics

62 relevant surveys, reported in 66 publications, included a total of 22 790 prisoners of whom 18 530 (81%) were men. In 47 surveys (12 859 prisoners) that included information on age, weighted mean age of prisoners was 29 years. 2568 (26%) of 9776 prisoners were charged with, or convicted of, violent offences (27 surveys included these data). These baseline characteristics varied little by disorder. The studies were from Australia (598 prisoners),^{18,39,50,52,61,69} Canada (3196),^{5,27,37,59,67,68} Denmark (583),^{12,32} Finland (1317),^{23,25,55} Ireland (280),^{15,49} Netherlands (450),^{14,21,35} New Zealand (1431),^{10,19,20} Norway (41),^{43,66} Spain (99),⁶⁵ Sweden (103),⁴⁰ UK (5548),^{6,8,11,22,26,28,33,41,42,46,47,51,53,60} and the USA (9144).^{7,9,13,16,17,24,29–31,34,36,38,44,45,48,54,56–58,62–64,70,71} 28 of the 62 surveys (11 071 prisoners) were done before 1990^{7,13,16–18,23–25,27,28,30–33,36–39,41,42,44,50,51,57–59,62,70,71} but, with the exception of female antisocial personality disorder, the overall prevalence rates did not differ significantly by whether surveys were done before or after 1990. Reported sampling strategies included complete sampling of entire prisons (1478 prisoners),^{8,29,40,50,52,66,67} simple random sampling (3768),^{11,15,17,18,20–23,25,33,34,36,37,41,44,47,51,54} stratified random sampling (10 563),^{7,9,13,24,27,28,31,38,39,45,46,53,60,70} inclusion of consecutive prisoners (3144),^{14,16,35,42,49,56–59,62,64,68,69} sampling of various prisoner subgroups (482),^{12,55,61} and

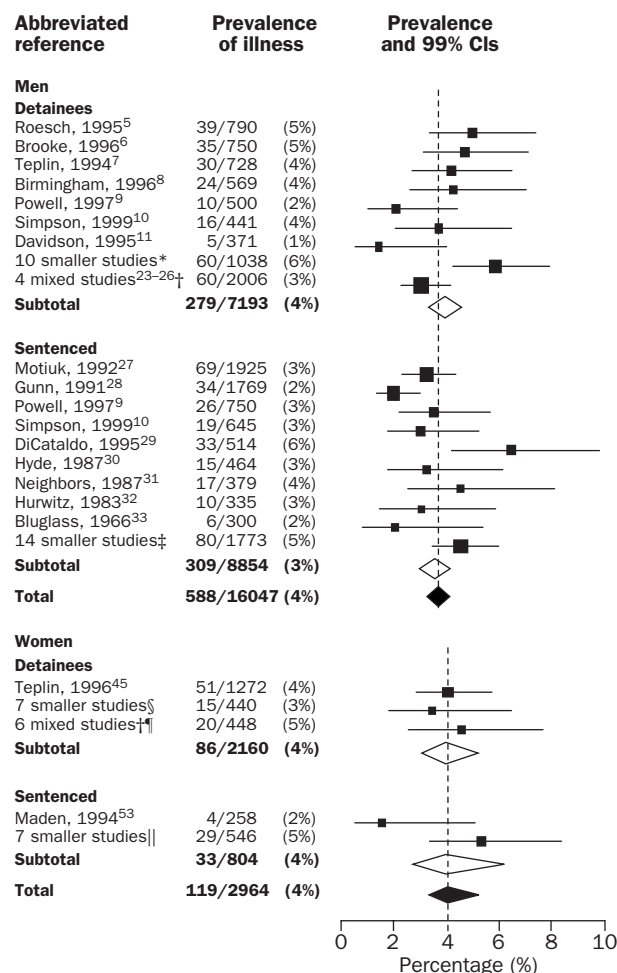


Figure 1: Prevalence of psychotic illnesses in 49 prison surveys

Size of black areas is proportional to number of prisoners. Open diamonds=subtotals; shaded diamonds=grand totals. *References 12–18, 20–22. †Mixed studies=surveys that did not report results separately for detainees and sentenced inmates. ‡References 15, 20, 21, 34–44. §References 11, 12, 46–50. ¶References 23–26, 51, 52. ||References 10, 20, 36, 39, 49, 50, 57.

various combinations of such strategies (2374).^{5,10,26} Apart from seven studies that included only 13% (2876 prisoners) of the total sample,^{27,34,36,40,55} the reported response rates were higher than 80%; in five^{27,34,36,40,55} of the seven surveys with lower participation rates, rates were still higher than 65%.

In some studies, diagnoses of psychotic illnesses and major depression were based solely on clinical examination, but in most studies trained interviewers had made diagnoses using validated questionnaires. For psychotic illnesses and depression, the instruments included: Diagnostic Interview Schedule,^{5,7,9,24,27,29,34,35,37,45,57,62} Composite International Diagnostic Interview,^{10,20,56} Structured Clinical Interview for the Diagnostic and Statistical Manual,^{30,31,39,50,52,66} Clinical Interview Schedule,^{6,8,11,28,46,53} Present State Examination-10,^{12,60} Schedule for Affective Disorders,²⁶ Diagnostic Interview for Children and Adolescents—Adolescent Version,⁵⁵ and Schedule for Clinical Assessment in Neuropsychiatry.⁴⁹ The following validated questionnaires were used by interviewers in studies of personality disorder: the Diagnostic Interview Schedule,^{5,7,9,24,27,31,34,35,37,45,56–59,61,62,65} Structured Clinical Interview for Diagnostic and Statistical Manual Personality Disorders,^{19,43,60,69} Personality Disorder

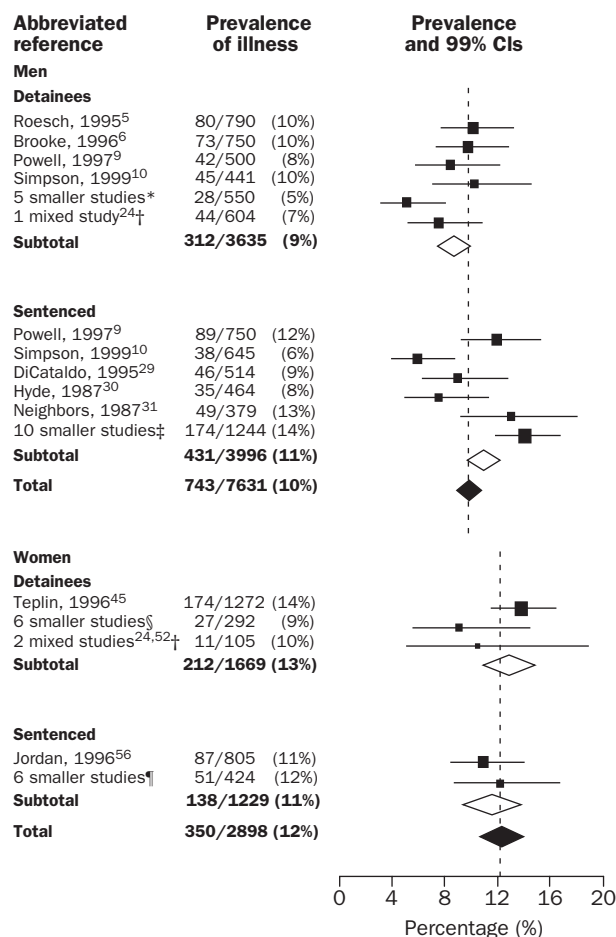


Figure 2: Prevalence of major depression in 31 prison surveys

Size of black areas is proportional to number of prisoners. Open diamonds=subtotals; shaded diamonds=grand totals. *References 12, 13, 20–22. †Mixed studies=surveys that did not report results separately for detainees and sentenced inmates. ‡References 20, 21, 34, 35, 37, 39, 42, 43, 54, 55. §References 12, 47–50, 71. ||References 10, 20, 39, 49, 50, 57.

Questionnaire,¹⁰ and Personality Disorder Examination.⁶⁷ There was generally no substantial heterogeneity within groupings of studies with fewer than 250 prisoners, and most studies reported insufficient detail to enable reliable assessments of the extent of psychiatric comorbidity.

Psychotic illnesses

49 relevant surveys on psychotic illnesses included a total of 19 011 prisoners.^{5–18,20–53,57} Overall, 3.7% (95% CI 3.3–4.1, figure 1)—or 588 of 16 047 male prisoners—were diagnosed with a psychotic illness. There was substantial heterogeneity among these studies ($\chi^2_{18}=68$, $p<0.0001$), and only a small part of it was explained by possible differences between studies that used validated diagnostic instruments and those that did not (3.5 vs 4.3%, respectively; $\chi^2_1=6.2$, $p=0.01$). There were significant differences between studies done in the USA and those done elsewhere (4.5 vs 3.3%, respectively; $\chi^2_1=13.7$, $p=0.0002$). Overall, 4.0% (3.2–5.1, figure 1)—or 119 of 2964 female prisoners—were diagnosed with a psychotic illness. There was no significant heterogeneity between these studies ($\chi^2_4=7.1$, $p>0.10$).

Major depression

We identified 31 relevant surveys that reported on major depression including a total of 10 529

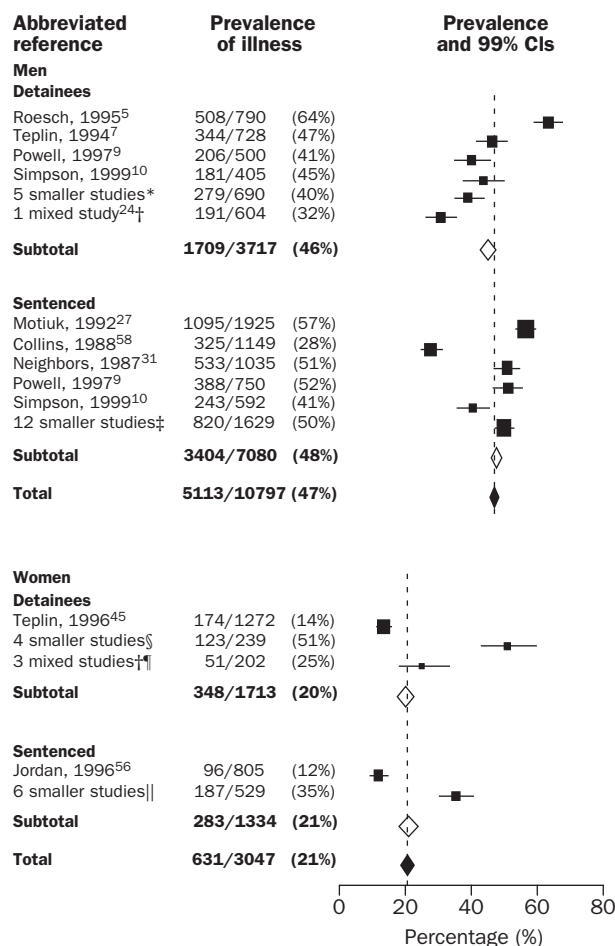


Figure 3: Prevalence of antisocial personality disorder in 28 prison surveys

Size of black areas is proportional to number of prisoners. Open diamonds=subtotals; shaded diamonds=grand totals. *References 12, 19, 21, 59, 60. †Mixed studies=surveys that did not report results separately for detainees and sentenced inmates. ‡References 19, 21, 34, 35, 37, 60–66. §References 12, 50, 67, 68. ||References 24, 60, 69. ||References 24, 50, 60, 67–69.

prisoners.^{5,6,9,10,12,13,20–22,24,29–31,34,35,37,39,42,43,45,47–50,52,54–57,71} Overall, 10% (9–11, figure 2)—or 743 of 7631 male prisoners—were diagnosed with major depression. There was substantial heterogeneity between these studies ($\chi^2_{11}=64$, $p<0.0001$), and this was only partly explained by differences between detainees and sentenced prisoners (9 vs 11%, respectively; $\chi^2_1=10.0$, $p=0.002$), between studies in which interviews were done by psychiatrists or not (7 vs 10%, respectively; $\chi^2_1=14.2$, $p=0.0002$), and between larger and smaller studies (9 vs 11%, respectively; $\chi^2_1=6.2$, $p=0.008$). Overall, 12% (11–14, figure 2)—or 350 of 2898 female prisoners—were diagnosed with major depression. Again, there was no significant heterogeneity between these studies ($\chi^2_4=7.0$, $p>0.10$).

Personality disorder

We identified 28 relevant surveys that reported on antisocial personality disorder including a total of 13 844 prisoners.^{5,7,9,10,12,19,21,27,31,34,35,37,43,45,56–65,67–70} Overall, 47% (46–48, figure 3)—or 5113 of 10 797 male prisoners—were diagnosed with antisocial personality disorder. There was substantial heterogeneity between these studies ($\chi^2_{11}=438$, $p<0.0001$), and this was partly explained by differences between studies done in the

USA and those done elsewhere (43 vs 52%, respectively; $\chi^2_1=93$, $p<0.0001$). In a subsidiary analysis of the four studies in which investigators reported on any personality disorder in men, 65% (61–68)—or 989 of 1529 male prisoners—were diagnosed with some personality disorder (including antisocial personality disorder).^{10,60,64,66} Overall, 21% (19–23, figure 3)—or 631 of 3047 female prisoners—were diagnosed with antisocial personality disorder. There was substantial heterogeneity between these studies ($\chi^2_4=285$, $p<0.0001$), much of which was accounted for by differences between larger and smaller studies (13 vs 37%, respectively; $\chi^2_1=236$, $p<0.0001$) and between studies done before and after 1990 (39 vs 17%, respectively; $\chi^2_1=125$, $p<0.0001$). There were also differences between studies done in the USA and those done elsewhere (18 vs 33%, respectively; $\chi^2_1=64$, $p<0.0001$) and between studies in which interviews were done by psychiatrists or not (42 vs 19%, respectively; $\chi^2_1=67$, $p<0.0001$). In a subsidiary analysis of the seven studies in which investigators reported on any personality disorder in women, 42% (38–45)—or 532 of 1281 female prisoners—were diagnosed with some personality disorder (including antisocial personality disorder).^{10,23,25,50,56,60,69} In the five studies in which borderline personality disorder was reported, this diagnosis was made in 25% (22–29)—or 307 of 1208—female prisoners.^{10,50,56,60,69}

Discussion

Our results suggest that typically about one in seven prisoners in western countries have psychotic illnesses or major depression (disorders that might be risk factors for suicide),⁸⁰ and about one in two male prisoners and about one in five female prisoners have antisocial personality disorders. These findings might have several implications.

First, they indicate that the risks of having serious psychiatric disorders are substantially higher in prisoners than in the general population. Compared with the general American^{24,81} or British⁸² population of similar age, prisoners have about two-fold to four-fold excesses of psychotic illnesses and major depression, and about a ten-fold excess of antisocial personality disorder. More research is needed to elucidate to what extent these excesses are causes, consequences, or both, of imprisonment (for example, the effect of substance abuse on the prevalence of psychosis in prisoners is not known).

Second, our findings suggest that the burden of treatable serious mental disorder in prisoners is substantial. For example, application of these typical prevalence rates to the prison population of the USA suggests that a few hundred thousand prisoners might have psychotic illnesses, major depression, or both—an amount that is twice the number of patients in all American psychiatric hospitals combined.⁸³ Given the limited resources of most prisons, however, it seems doubtful whether most prisoners with these illnesses receive appropriate care, such as that mandated by the European Convention on Human Rights and other international charters.⁸⁴

Finally, although only about one-third of the world's prisoners live in western countries, about 99% of available data from prison surveys are derived from western populations, which underscores the need for greater forensic psychiatric research in non-western populations.

Even though our review was restricted to surveys done in western countries, it included data gathered during

several decades from different prison populations in 12 countries. The prevalence of psychiatric disorders might, therefore, have been expected to vary substantially as a result of such differences, as well as because of differences in medical and judicial systems and in survey methods. But, although we noted that estimates of prevalence of antisocial personality disorder varied considerably, there was much less variation in psychotic illnesses and major depression (perhaps, in part, because of greater diagnostic consensus for these two disorders). Despite the likelihood that there are some real differences in the prevalence of psychiatric disorders in different prison circumstances, our summary estimates can help inform public policy and public health initiatives, particularly in areas where reliable local information is lacking.

Since a few million prisoners worldwide probably have serious mental disorders (including several hundreds of thousands with potentially treatable psychosis or depression), the ability of prison health services in some countries to address these problems may well require review.

Contributors

S Fazel and J Danesh drafted the report and were involved in study design, conduct, analysis, and interpretation.

Conflict of interest statement

None declared.

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