The prevalence of intellectual disabilities among 12000 prisoners — A systematic review

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A R T I C L E   I N F O

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A B S T R A C T

There are 9 million prisoners worldwide, but it is uncertain what proportion have intellectual disabilities. Such prisoners have been identified as a vulnerable group at risk of victimization and mental illness. Psychiatric surveys based on interviews of unselected prison populations were sought, involving diagnoses of intellectual disabilities. The search was performed by computer-assisted searches, scanning of relevant reference lists, hand-searching of journals, and correspondence with authors of relevant reports. Prevalence rates of intellectual disabilities by gender and other potentially relevant study characteristics were abstracted from publications, supplemented by information from authors of reports. Ten relevant surveys from four different countries were identified that included a total of 11,969 prisoners (mean age: 29 years; 92% male; 23% violent offenders). No formal calculation of a summary estimate of prevalence was undertaken due to substantial heterogeneity. The results suggest that typically 0.5–1.5% of prisoners were diagnosed with intellectual disabilities (range 0% to 2.8% across studies). We conclude that the number of prisoners with intellectual disabilities is considerable and discuss implications for policy and practice.

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1. Introduction

Uncertainty exists about the prevalence of intellectual disabilities in prison populations. Those with intellectual disabilities are a vulnerable population at increased risk of victimisation and mental illness, both risks exacerbated by incarceration (Glaser & Deane, 1999; Noble & Conley, 1992). Large surveys of prison populations have indicated that up to 10% may have intellectual disabilities (Brown & Courtless, 1968) but other studies have found prevalence rates of less than 1% (Gunn, Maden, & Swinton, 1990). Previous reviews in this area have highlighted reasons for the variations in previous surveys and have been restrictive in their scope (McBrien, 2003).

In recent years there has been an increasing (public, clinical and academic) awareness of developmental disorders such as Autism Spectrum Disorders and Attention Deficit Hyperactivity Disorder in the general population. This has led to a more accurate assessment and recognition of these conditions in the general population. Adults with intellectual disabilities are more likely than the general population to present with autistic and inattentive/hyperactive symptoms. There is a tendency at least in the UK for litigation to be brought in cases that the recognition of intellectual disability or other developmental disorder was missed during the developmental period. These are the very features that are likely to bring people with intellectual disabilities in conflict with the law. Therefore the relevance of identification of developmental disorders in prison is likely to be increasing.

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Accurate estimates of the prevalence of intellectual disabilities among prisoners can be used to inform public policy and the planning of prison health services. Prison can offer a unique opportunity to assess and begin to meet the healthcare needs of special populations, particularly those who are marginalized and have difficulties in accessing healthcare in the community (Glaser & Greiffinger, 1993). We have therefore conducted a systematic review of surveys of the prevalence of intellectual disabilities among general prison populations to inform researchers, practitioners, and policy makers.

2. Methods

Studies of the prevalence of intellectual disabilities in general prison populations reported between January 1966 and June 2004 were sought by searches of electronic bibliographic databases (MEDLINE, EMBASE, PsycINFO, CINAHL, US National Criminal Justice Reference System) using combinations of keywords relating to intellectual disabilities (e.g., intellectual disabilities, mentally retarded, learning disorders/disabilities, mental retardation) and to prisoners (e.g., inmate, sentenced, remand, detainee, felon). This was supplemented with scanning of article reference lists; hand-searching of intellectual disabilities journals (American Journal on Intellectual disabilities, British Journal of Learning Disability, British Journal of Developmental Disabilities, Journal of Applied Research in Intellectual Disability, Journal of Intellectual Disability Research, Learning Disability Review); use of a reference collection based on a related systematic review of mental illness and personality disorder in prisoners (Fazel & Danesh, 2002); and discussion and correspondence with authors of relevant reports. Studies were included if all of the following were met: (a) presented primary data on the prevalence of intellectual disabilities; (b) sampled from a representative or random sample of detainees or sentenced prisoners; (c) used validated instruments for measuring IQ and/or expert clinical examination on individual subjects; and (d) presented quantitative findings including numerator and denominator. Although we aimed to use the standard diagnostic criteria for intellectual disabilities, which includes a reduced level of intellectual functioning (an IQ of less than 70 from a standardised, individually administered intelligence test), which is of developmental origin and resulting in diminished ability to adapt to the daily demands of the normal social environment, some studies did not report on the social functioning criteria. Subgroup analyses were performed to investigate differences in prevalences based on criteria used. Studies were excluded if: they only included a select sample of prisoners (MacEachron, 1979; Spruill & May, 1988); had been referred for psychiatric assessment (Edwards, Morgan & Faulkner, 1994); if they used group psychometric testing (Brown & Courtless, 1968; Denkowski & Denkowski, 1985); if they only identified a subcomponent of IQ (e.g. reading ability) (Jensen, Lindgren, Meurling, et al., 1999); if they oversampled prisoners with low IQ scores on screening (Sundram, Platt, & Cashen, 1991); reported cognitive impairment solely (Bland, Newman, Dyck, et al., 1990; Schretlen, 1990; Teplin, 1994), surveyed prison staff for their estimates of prevalence (Veneziano & Veneziano, 1996); or used case note information alone (Coid, 1988). We used 1966 as the start date as this is when Medline started its bibliographic index.

For each eligible study, the following were abstracted independently by two authors (SF and JP) according to a fixed protocol. This was supplemented by correspondence with authors of relevant studies and any discrepancies were resolved by further review: geographical location; year of interview; number of prisoners interviewed; sampling method; type of prisoner (detainee or remand vs sentenced inmate); response rate; diagnostic instrument(s) and criteria; type of interviewer; number diagnosed with intellectual disabilities; mean age; proportion male; number with violent offences; and mean duration of imprisonment at the time of interview. For studies that tested a subgroup initial screening, extrapolations were made to determine prevalence in the initial population screened to account for attrition between screening and subsequent psychological assessment. We used Cochran’s Q test to investigate heterogeneity between studies.

3. Results

Ten relevant surveys were identified that included a total of 11,969 prisoners (Birmingham, Mason & Grubin, 1996; Brandford, 1997; Ghubash & El-Rufaie, 1997; Gunn et al., 1990; Hayes & Mcllwain, 1988; Irion, 1988; Jones & Coombes, 1990; Maden, Taylor, Brooke, & Gunn, 1996; Maden, Swinton, & Gunn, 1994; Murphy, Harnett, & Holland, 1995). Seven of the surveys (7399 prisoners) reported in detail on baseline characteristics (Birmingham et al., 1996; Ghubash & El-Rufaie, 1997; Gunn et al., 1990; Irion, 1988; Jones & Coombes, 1990; Maden et al., 1996; Maden et al., 1994; Murphy et al., 1995), yielding a weighted mean age of 29 years (92% were male and 23% charged with, or convicted of, violent offences). The studies were conducted in Australia (1701 prisoners) (Hayes & Mcllwain, 1988; Jones & Coombes, 1990), Dubai (142 prisoners) (Ghubash & El-Rufaie, 1997), New Zealand (4064 prisoners) (Brandford, 1997), the UK (3728 prisoners) (Birmingham et al., 1996; Gunn et al., 1990; Maden et al., 1996; Maden et al., 1994), and the USA (2334 prisoners) (Irion, 1988). All were conducted after the year 1988.

Reported sampling strategies ranged from complete sampling of entire prisons (8099 prisoners) (Brandford, 1997; Hayes & Mcllwain, 1988; Irion, 1988; Jones & Coombes, 1990), to stratified random sampling (3130 prisoners) (Gunn et al., 1990; Maden et al., 1996; Maden et al., 1994), to inclusion of consecutive prisoners (598 prisoners) (Birmingham et al., 1996; Murphy et al., 1995), or unidentifiable for one study (142 prisoners) (Ghubash & El-Rufaie, 1997). Apart from two studies that included 10% (1241 prisoners) of the total sample (Jones & Coombes, 1990; Murphy et al., 1995), the reported response rates were in excess of 66% (and in the two with lower participation rates, they were still higher than 50%). All studies used the International Classification of Diseases (ICD) or American Association of Mental Retardation (AAMR) criteria. Some studies used a one stage determination of prevalence using clinical criteria and information from medical notes (which may have reported IQ tests) (Ghubash & El-Rufaie, 1997; Gunn et al., 1990; Maden et al., 1994). The other studies used a two stage strategy involving a screening test followed by a clinical or psychometric assessment using the WAIS-R (Birmingham et al., 1996; Brandford, 1997; Hayes & Mcllwain, 1988; Irion, 1988; Jones & Coombes, 1990; Murphy et al., 1995).
still be used to inform public policy and planning, particularly where reliable local information is lacking. However, the range of prevalence estimates of the present review cannot be synthesized due to the substantial heterogeneity between these studies, which is most likely secondary to variations in sentencing and differences in healthcare and justice systems and in survey methods. Caution must be applied when synthesizing results from studies without an overall pooled estimate. Also, it should be noted that all the studies referred to are from common law nations.

Diagnostic practices over time and between countries. For this reason Table 1 was presented as a descriptive table of previous studies of the prevalence of intellectual disabilities (ID) in prison populations. The prevalence might be expected to vary substantially due to differences in healthcare systems, justice systems, and in survey methods. Due to the significant heterogeneity between these studies, a pooled overall prevalence rate was not calculated.

The two screening studies are reported in Table 2. The pooled prevalence of screen positive cases was 6.1% (95% CIs: 5.3–7.0%; 325 out of 5329 prisoners).

### 4. Discussion

The present review of 10 surveys among around 12000 prisoners provides the most comprehensive summary so far of the prevalence of intellectual disabilities in general prison populations. The prevalence might be expected to vary substantially due to differences in healthcare and justice systems and in survey methods. Caution must be applied when synthesising results from these studies due to the substantial heterogeneity between them, which is most likely secondary to variations in sentencing and diagnostic practices over time and between countries. For this reason Table 1 was presented as a descriptive table of previous studies without an overall pooled estimate. Also, it should be noted that all the studies referred to are from common law nations and we did not identify any studies from civil law countries. However, the range of prevalence estimates of the present review can still be used to inform public policy and planning, particularly where reliable local information is lacking.

### Table 1

Studies of the prevalence of intellectual disabilities (ID) in prison populations (in order of sample size)

<table>
<thead>
<tr>
<th>Study</th>
<th>Location</th>
<th>Total no.</th>
<th>Screening procedure</th>
<th>Final diagnosis</th>
<th>Interviewer</th>
<th>No. with ID</th>
<th>% ID</th>
<th>95% CI</th>
<th>Mean age</th>
<th>Gender</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brandford (1997)</td>
<td>New Zealand (NZ)</td>
<td>3900</td>
<td>Functional questionnaire</td>
<td>WAIS-R &amp; clinical</td>
<td>Psychologists</td>
<td>18*</td>
<td>0.5</td>
<td>0.3–0.8</td>
<td>NA</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Irion (1988)</td>
<td>USA</td>
<td>2156</td>
<td>CFIQ</td>
<td>WAIS-R</td>
<td>Psychiatrists</td>
<td>32</td>
<td>1.5</td>
<td>1.0–2.3</td>
<td>29</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Gunn (1990)</td>
<td>England &amp; Wales</td>
<td>2052</td>
<td>Quick test</td>
<td>Clinical</td>
<td>Psychiatrists</td>
<td>11</td>
<td>0.5</td>
<td>0.3–1.1</td>
<td>28</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Jones (1990)</td>
<td>Australia</td>
<td>968</td>
<td>Educational level and prison adaptation</td>
<td>WAIS-R, WJISB &amp; clinical</td>
<td>Psychologists</td>
<td>10*</td>
<td>1.0</td>
<td>0.5–2.2</td>
<td>28</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Maden (1996)</td>
<td>England &amp; Wales</td>
<td>651</td>
<td>Quick test</td>
<td>Clinical</td>
<td>Psychiatrists</td>
<td>5</td>
<td>0.8</td>
<td>0.3–2.3</td>
<td>28</td>
<td>Male</td>
<td>Remand</td>
</tr>
<tr>
<td>Hayes (1988)</td>
<td>Australia</td>
<td>594</td>
<td>Functional questionnaire</td>
<td>WAIS-R</td>
<td>Psychologists</td>
<td>10</td>
<td>1.7</td>
<td>0.8–3.7</td>
<td>NA</td>
<td>Male</td>
<td>Mixed</td>
</tr>
<tr>
<td>Birmingham (1986)</td>
<td>England</td>
<td>441</td>
<td>Quick test</td>
<td>Clinical</td>
<td>Psychiatrists</td>
<td>6</td>
<td>1.4</td>
<td>0.5–3.7</td>
<td>28</td>
<td>Male</td>
<td>Remand</td>
</tr>
<tr>
<td>Maden (1994)</td>
<td>England &amp; Wales</td>
<td>258</td>
<td>Quick test</td>
<td>Clinical</td>
<td>Psychiatrists</td>
<td>6</td>
<td>2.3</td>
<td>0.9–6.2</td>
<td>29</td>
<td>Female</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Irion (1988)</td>
<td>USA</td>
<td>178</td>
<td>CFIQ</td>
<td>WAIS-R</td>
<td>Psychiatrists</td>
<td>2</td>
<td>1.1</td>
<td>0.2–5.6</td>
<td>29</td>
<td>Female</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Maden (1996)</td>
<td>England &amp; Wales</td>
<td>169</td>
<td>Quick test</td>
<td>Clinical</td>
<td>Psychiatrists</td>
<td>4</td>
<td>2.4</td>
<td>0.7–7.6</td>
<td>31</td>
<td>Female</td>
<td>Remand</td>
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<tr>
<td>Brandford (1997)</td>
<td>NZ</td>
<td>164</td>
<td>Functional questionnaire</td>
<td>WAIS-R &amp; clinical</td>
<td>Psychologists</td>
<td>0*</td>
<td>0</td>
<td>0–3.9</td>
<td>NA</td>
<td>Female</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Murphy (1995)</td>
<td>England</td>
<td>157</td>
<td>Functional questionnaire</td>
<td>WAIS-R</td>
<td>Psychologists</td>
<td>0</td>
<td>0</td>
<td>0–4.1</td>
<td>30</td>
<td>Male</td>
<td>Remand</td>
</tr>
<tr>
<td>Ghubash (1997)</td>
<td>Dubai</td>
<td>142</td>
<td>Functional questionnaire</td>
<td>WAIS-R</td>
<td>Psychologists</td>
<td>4</td>
<td>2.9</td>
<td>0.8–9.0</td>
<td>29</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Hayes (1988)</td>
<td>Australia</td>
<td>81</td>
<td>Functional questionnaire</td>
<td>WAIS-R</td>
<td>Psychologists</td>
<td>0</td>
<td>0</td>
<td>0–7.6</td>
<td>NA</td>
<td>Female</td>
<td>Mixed</td>
</tr>
<tr>
<td>Jones (1990)</td>
<td>Australia</td>
<td>58</td>
<td>Educational level and prison adaptation</td>
<td>WAIS-R, WJISB &amp; clinical</td>
<td>Psychologists</td>
<td>1*</td>
<td>1.9</td>
<td>0.2–13.4</td>
<td>28</td>
<td>Female</td>
<td>Sentenced</td>
</tr>
</tbody>
</table>

Note: *=estimate based on final numbers with intellectual disabilities extrapolated to original study population (this figure was used where insufficient information is reported).
NA=not available; CFIQ=Culture-fair intelligence quotient; WAIS-R=Wechsler adult intelligence scale — revised; WJISB=Woodstock Johnson Scales of Independent Behaviour.

### Table 2

Studies using simple screening procedure for intellectual disabilities in prisoners

<table>
<thead>
<tr>
<th>Screening studies</th>
<th>Location</th>
<th>Total no. screened</th>
<th>Screening procedure</th>
<th>Screening cut-off</th>
<th>Interviewer</th>
<th>No. screen positive</th>
<th>% screen positive</th>
<th>Gender</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Finn (1993)</td>
<td>USA</td>
<td>2188</td>
<td>Revised Beta IQ</td>
<td>IQ&lt;70</td>
<td>Psychologists</td>
<td>57</td>
<td>2.6</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Singleton (1998)</td>
<td>England &amp; Wales</td>
<td>1250</td>
<td>Quick test</td>
<td>Quick &lt;40</td>
<td>Lay interviewers</td>
<td>138</td>
<td>11.0</td>
<td>Male</td>
<td>Remand</td>
</tr>
<tr>
<td>Singleton (1998)</td>
<td>England &amp; Wales</td>
<td>1120</td>
<td>Quick test</td>
<td>Quick &lt;40</td>
<td>Lay interviewers</td>
<td>56</td>
<td>5.0</td>
<td>Male</td>
<td>Sentenced</td>
</tr>
<tr>
<td>Singleton (1998)</td>
<td>England &amp; Wales</td>
<td>187</td>
<td>Quick test</td>
<td>Quick &lt;40</td>
<td>Lay interviewers</td>
<td>21</td>
<td>11.2</td>
<td>Female</td>
<td>Remand</td>
</tr>
</tbody>
</table>

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Our search strategy and inclusion criteria identified a number of institutional reports that were not published in the peer-reviewed psychiatric and intellectual disabilities literature, but nevertheless contained useful data. We chose to exclude studies that have previously been widely cited but only used group IQ testing without individual clinical assessment. The relatively high prevalences found in the screening studies indicate that such results should not be used as a basis for estimating the prevalence of clinically diagnosed intellectual disabilities. Nevertheless, they signify that the extent of less severe disabilities can be as high as 1 in 10 in remand prisoners in England and Wales. One of the limitations of this review is that a number of the studies included in the review used IQ as the sole criterion for a diagnosis of intellectual disabilities, omitting the criteria of adaptive skills impairment and developmental origins of the condition. A few used clinical criteria only, but we found no difference in prevalence rates depending on the diagnostic method used.

Thus, the variation in definition as well as diagnostic and survey methodologies need to be taken into account in interpreting the findings of our study. Our findings suggest that typically between 0.5 and 1.5% of prisoners have a clinical diagnosis of intellectual disabilities, which is at least as common as in the general population of similar age as found in some surveys (Kavanagh & Opit, 1999). Some people with intellectual disabilities are prone to challenging, including offending, behaviour. Moreover, a proportion of criminal offending amongst people with intellectual disabilities is likely to be undetected or, if detected, to remain unreported. Intellectual disabilities and challenging behaviour has been identified by the UK government as an area of collaboration between specialist and generic services (Department of Health, 2001). A recent Scottish Executive publication (Myers, 2004) highlighted the issue of under-identification of intellectual disabilities and/or autistic spectrum disorders in secure settings, including prisons, in-patient and forensic psychiatric units, and secure accommodation units. It was further noted that in terms of interagency working, with the exception of the specialist in-patient units for people with intellectual disabilities, the involvement of specialists in learning disabilities was rare. It was suggested that there is scope for linking the different policy initiatives as they impact upon this group of people. From a practice development point of view there is a need for greater co-ordination of information and assessment, particularly within prisons.

The death penalty in general and in particular in people with intellectual disabilities has been widely debated on moral and legal grounds. Estimates of intellectual disabilities amongst prisoners in death row vary considerably. One report indicated prevalences ranging from 2–20%, but acknowledges at the same time that ‘there are no definitive statistics on this’ (Hall, 2002). Moreover, no consensus exists on criteria determining which offenders are ‘in fact retarded’ (Coleman & Shellow, 2003). A recent Swedish population study of homicide offenders, the largest to date in the world, using standardized diagnoses found that only 0.8% had intellectual disabilities (Fazel & Grann, 2004). Therefore our estimate in prison populations is similar to that found in this sample of homicide offenders.

Prisoners with intellectual disabilities are a vulnerable population. A UK study of prison suicides found that 3% of prisoners who committed suicide had a primary diagnosis of intellectual disabilities (Shaw, Appleby, & Baker, 2003), which is at least double the rate of suicide in other prisoners using the prevalence estimates reported here. People with intellectual disabilities are also at increased risk of mental illness and victimisation (Glaser & Deane, 1999; Noble & Conley, 1992). Wider service developments including court diversion and alternative to prison schemes have been reported (Nøttestad & Linaker, 2005). Health service providers to prisoners should take note of the prevalence ranges of intellectual disabilities reported in this review. Service issues that need to be considered include development of treatment programmes specifically designed for this group of people, training of prison staff and promotion of links between criminal justice, forensic mental health and intellectual disabilities services.

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