

## Correlates of HIV/AIDS knowledge in a Scottish prison sample

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### Abstract

A sample of 559 inmates in Scottish prisons were administered a 48-item HIV/AIDS knowledge questionnaire. High levels of HIV-related knowledge were associated with: a history of drug offences, having had an HIV test, knowing someone who has had an HIV test, knowing someone who is HIV seropositive, a history of injecting drug use and having a sexual partner who is also an injecting drug user. Inmates who are objectively at high risk of contracting HIV by virtue of their drug injecting and sexual behaviour are also amongst the most knowledgeable inmates, with regard to HIV/AIDS. Unfortunately, such knowledge does not result in the adoption of risk reduction behaviours. Results are discussed in relation to the heterogeneity of inmate populations and the diversity of their educational needs.

### Introduction

In recent years considerable attention has been given to the issue of HIV/AIDS in prison (Brewer and Derrickson, 1992; McKee and Power, 1992; Pagliaro and Pagliaro, 1992). It has been assumed that behaviours likely to facilitate the transmission of HIV are rife amongst prison populations (Brown, 1993). Amongst male and female prisoners such behaviours are the sharing of drug injecting equip-

ment, and amongst male prisoners participation in unprotected penetrative homosexual intercourse. It is widely agreed that since there is presently no known vaccine or cure for HIV/AIDS that a reduction of high-risk behaviour is essential in order to quell the spread of the disease (Becker and Joseph, 1988). To achieve this goal a number of health education initiatives have been launched both in the wider community (Marková and Power, 1992) and within the prison system (Home Office, 1989). With regard to the prison context, it has been argued that many inmates are ignorant about high-risk behaviour and how to actually reduce risk (Prison Reform Trust, 1988). Somewhat surprisingly very few studies have assessed the level of HIV/AIDS-related knowledge amongst prison populations. In a study of 43 young offenders, O'Mahony (1989) included 15 factual information questions about AIDS. This study concluded that although there was a high level of knowledge about the basic facts about AIDS, there were a significant number of incorrect responses regarding questions concerning contagion by touch and the preventive effectiveness of avoiding injecting drug use. While studying a sample of 38 HIV seropositive prisoners in the Irish prison system, O'Mahoney and Barry (1992) used the Knowledge of AIDS at Risk Behaviour Scale (Kelly *et al.*, 1989) to test respondents knowledge of the type of behaviours that can put people at risk of HIV infection. These authors concluded that considering the HIV seropositive status of their sample, the knowledge of at risk behaviour was unsatisfactorily low.

In a study of 193 Australian inmates, Conolly (1989) used a 20-item knowledge questionnaire

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which focused on transmission of HIV, HIV blood test, development of AIDS, and the signs and symptoms of people who become sick. Although over 90% of inmates knew the very basic message that AIDS was transmitted through 'sex without condoms' and 'sharing needles', the average knowledge scores for all prisoners were very low. Zimmerman *et al.* (1991) assessed AIDS knowledge levels among 108 inmates from a medium security Pennsylvania prison using 24 items of the 45-item Knowledge and Attitude Questionnaire (Celentano *et al.*, 1990). Of the four separate content areas investigated, inmates were quite knowledgeable about established routes of HIV transmission. However, there was considerable confusion about unlikely routes of transmission and especially about behaviour involving casual contact. In a sample of 452 ex-prisoners in England, Turnbull *et al.* (1991) noted that 18% knew of one method of HIV transmission, 93% correctly named two methods of HIV transmission and 73% named three methods. In a more detailed study, Power *et al.* (1993) interviewed 559 inmates from eight Scottish prisons using a 48-item knowledge questionnaire. This study concluded that inmates were highly knowledgeable on certain topics. Prisoners were aware of basic high-risk sexual and drug behaviour. They knew that the virus was not transmitted by routine social contact. Prisoners were also aware of most methods of reducing the risk of transmission. However, many showed less understanding about issues concerning the HIV antibody test and many believed it safe to share items of injecting equipment such as cooking-up spoons, and there was uncertainty about the effectiveness of bleach solution as a sterilizing agent for injecting equipment.

The results of these studies provide contradictory conclusions regarding the level of HIV/AIDS knowledge amongst prison populations. This discrepancy between studies may be due in part to the different methods and measures used to assess HIV/AIDS knowledge. Furthermore, characteristics of the different inmate populations may also contribute to the variability in results, e.g. amount and source of inmate HIV/AIDS education, the

percentage of drug versus non-drug users in each population, etc. As such the above studies fail to address the heterogeneity of prison populations and fail to take into account some of the main factors which might be related to levels of HIV/AIDS knowledge. It is important for educators to be aware of the factors and inmate characteristics that are associated with HIV/AIDS-related knowledge, gaps in knowledge or errors in knowledge. Only by having such data readily available can educational initiatives be more appropriately targeted to meet the needs of specific groups within the prison population.

The present study was a follow-on from that conducted by Power *et al.* (1993), which attempted to assess in specific detail areas of knowledge, misconceptions and ignorance in a large representative sample of inmates, using a comprehensive HIV/AIDS information questionnaire. The main aim of the present study was to identify the inmate characteristics associated with such levels of information or misinformation.

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## Method

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### Subjects

The prisoner sample was drawn from eight Scottish prisons. The eight penal establishments were selected as being representative of Scottish Prisons in terms of prison security category and standard prison regime. Five male adult prisons, two male young offender institutions, and one female adult and young offender institution were chosen. The prisoner sample was selected so as to achieve comparable numbers of remand, short-term and long-term prisoners within both adult and young offender institutions. Within these sentence categories prisoners were randomly drawn from those available and willing to participate. Information was not collected on those inmates who refused to take part and we are therefore unable to state whether any selection bias occurred. However, there was no selection bias in terms of penal institution and inmate sentence categories, as there was no significant difference in response rate

between institutions or between inmate sentence categories. The overall response rate was 86.4% ( $n = 559$ ).

### Demographic characteristics

Prisoners had a mean age of 25.1 years, with an age range of 16–68 years. With regard to gender, 480 (85.9%) were male and 79 (14.1%) were female. A total of 353 (63.1%) were single, with 147 (26.3%) married or cohabiting and 59 (10.6%) divorced, widowed or separated. With regard to educational achievements, 414 (74.1%) had no formal educational qualifications, or only a certificate of secondary education, while 120 (21.5%) possessed 'O' Levels or 'O' Grades and 25 (4.5%) had higher qualifications.

### Prison career

Remand prisoners constituted approximately one-third of the sample ( $n = 190$ , 34.0%), while the remainder were on short-term (less than 3 years;  $n = 205$ , 36.7%) or long-term (3 years or more;  $n = 164$ , 29.3%) sentences. Excluding the 190 remand inmates, the mean sentence length was 56.7 months (range: 1 month to 20 years), with a life sentence rated as 20 years. The mean length of time served of current sentences was 15.9 months (range: 1 month to 20 years). For all prisoners, the mean number of previous sentences was 3.6 (range: 0–98) and the mean total time served as 33.9 months (range: 1 month to 30 years). Just over one-quarter of prisoners ( $n = 144$ ; 25.8%) had at some time been charged with a drug offence.

### Procedure

Inmates were interviewed in private. Prior to participation in the study they were informed that the survey was part of a series of studies concerned with the assessment of HIV/AIDS knowledge and attitudes. They were also informed that more personal information about sexual behaviour (Power *et al.*, 1992a) and injecting drug use (Power *et al.*, 1992b) would also be required. Once the purpose of the study had been explained and assurances of anonymity and confidentiality had

been given, inmates were given the opportunity to decide whether they wished to participate. It was emphasized to inmates that the study was anonymous, voluntary and confidential, that their name and inmate number was not required, and that the data would be stored and analysed outside the Scottish Prison Service.

### Measures

A knowledge questionnaire was developed from the literature on HIV/AIDS specifically for use in the present research, using similar items and content areas to those used by Celentano *et al.* (1990) and Zimmerman *et al.* (1991). The questionnaire consists of 48 items, each with a choice of three responses—true, false or don't know. Thus to give a fuller picture of knowledge levels: (1) the frequency of correct responses can be calculated to produce a 'knowledge' score, (2) the frequency of incorrect responses can be calculated to give a 'misinformation' score and (3) the frequency of don't know abstentions can be calculated to produce a 'knowledge gap' score.

The 48 items were combined into six content areas, each with eight items, on an *a priori* basis, in order to tap inmates' knowledge of specific areas for HIV and AIDS. Certain items were specifically concerned with either HIV or AIDS, other items were concerned with differences between HIV and AIDS. However, we knew from pilot work that some inmates were unlikely to be aware of differences between HIV and AIDS while others used the term synonymously. It was therefore decided that for items not specifically related to either HIV or AIDS the term HIV/AIDS be used. The six content areas were as follows: knowledge of (1) the nature of HIV infection and AIDS among inmates; (2) the prevalence and relative risk of HIV/AIDS compared with other health problems among inmates; (3) high-risk modes of transmission among inmates; (4) lack of risk associated with casual social contact among inmates; (5) methods of preventing HIV transmission among inmates; and (6) risk of transmission of HIV in prison environment among inmates. [For a detailed

breakdown of responses to all 48 items and each subscale, see Power *et al.*, 1993.]

### **HIV/AIDS awareness**

Nearly one-quarter of the sample ( $n = 135$ ; 24.2%) reported having taken an HIV test. A total of 488 prisoners (73.0%) claimed to know someone who had taken an HIV test, while 353 (63.1%) reported knowing someone who was HIV seropositive and 243 (43.5%) claimed to know someone with AIDS. As previously reported, HIV self-perceived risk was significantly higher prior to imprisonment than during imprisonment (Power *et al.*, 1992a). When asked about their risk of HIV/AIDS outside prison, 322 (57.6%) thought they had been at no or low risk, 126 (22.2%) thought they had been at medium risk and 111 (19.9%) thought they had been at high or very high risk. Excluding nine HIV seropositive prisoners, 442 (80.4%) prisoners thought they were at no or low risk of HIV/AIDS in prison, 68 (12.4%) thought they were at medium risk and 40 (7.3%) thought they were at high or very high risk.

With regard to where prisoners believed they derived most of their HIV/AIDS related information, 249 (44.5%) prisoners reported that they had received most information about HIV/AIDS outside of prison, while 233 (41.7%) felt they had received most information inside prison and 77 (13.8%) felt they had received information equally from both environments. Approximately half of the prisoners ( $n = 286$ ; 51.2%) indicated that the media were their main source of HIV/AIDS information with 65 (11.6%) reporting that family and friends were their main source. A Home Office video specifically designed as an educational programme for use with prisoners and titled 'AIDS: Inside and Out' had been seen by a total of 323 (57.8%) of inmates and amongst this group 103 (18.4%) cited this video as their main source of HIV/AIDS information. Only 36 (6.4%) inmates cited prison literature as their main source of information, while 54 (9.7%) regarded prison officers as their main source of information.

### **Sexual behaviour**

From a total of 559 inmates, 543 (97.1%) had a sexual relationship prior to imprisonment. The

remaining 16 (2.9%) inmates were either virgins or had been celibate for a period of at least 10 years prior to imprisonment. Of sexually experienced prisoners, 41 (7.6%) had no sexual partners in the month before imprisonment, 319 (58.7%) had one sexual partner and 183 (33.7%) had more than one sexual partner. All inmates with a sexual history were asked whether they had adopted any sexual precautions prior to imprisonment to reduce their chance of becoming infected with HIV. For a small proportion ( $n = 14$ ; 2.5%) regular condom use was not regarded as a viable option for HIV risk reduction as AIDS was not known to exist when last at liberty. After excluding such inmates ( $n = 14$ ; 2.5%) plus those who were virgins or celibate ( $n = 16$ ; 2.9%), of the remaining 529 inmates the overwhelming majority ( $n = 457$ ; 86.4%) had not used condoms prior to imprisonment. As an HIV/AIDS risk reduction strategy, of the 404 prisoners not in long-term monogamous relationships and sexually active, 195 (48.3%) reported selecting partners more carefully and 166 (41.1%) reported reducing their number of sexual partners. When released from prison 262 (46.9%) inmates reported that they definitely would not use a condom during sexual intercourse.

### **Injecting drug behaviour**

A group of 154 (27.5%) prisoners had injected drugs prior to imprisonment, while 135 (24.2%) of prisoners had a sexual partner who injected drugs. Of the 154 prisoners who had injected drugs prior to imprisonment, 97 (63.0%) had shared injecting equipment. Of the 97 who had shared injecting equipment prior to imprisonment, 42 (48.3%) had sterilized their equipment prior to sharing. A total of 43 (7.7%) prisoners had injected drugs at some time during custody and of this group 32 (74.4%) shared injecting equipment whilst in custody. A group of five prisoners who had not injected drugs prior to custody did so during custody. Of the 159 prisoners who had injected drugs at some time, either outside or whilst imprisoned, 80 (50.3%) indicated that they may inject drugs once released.

## Results

Data were analysed so as to establish whether prisoners' demographic characteristics, prison career, HIV/AIDS awareness, sexual behaviour and drug injecting behaviour were associated with their replies to the 48-item HIV/AIDS questionnaire in terms of the total number of correct responses (knowledge), incorrect responses (misinformation) or don't knows (knowledge gap). Results are presented in Tables I–III. (For reasons

of brevity, means and standard deviations for the knowledge questionnaire are not presented for all the different levels of the independent variables; however, these results are available on request from the authors.)

### Demographic characteristics and prison career

Among the demographic characteristics there was no significant relationship between marital status or sex and performance on the HIV/AIDS knowledge

**Table I.** Association between prisoners' demographic characteristics and prison career, and HIV/AIDS knowledge ( $n = 559$ )<sup>a</sup>

	Knowledge (correct responses)	Knowledge gaps (don't know responses)	Misinformation (incorrect responses)
Demographic characteristics			
age	NS	NS	$r = 0.12^{**}$
sex	NS	NS	NS
marital status	NS	NS	NS
education level	$F = 9.31^{***}$	NS	$F = 6.69^{**}$
Prison career			
length of current sentence ( $n = 369$ ) <sup>b</sup>	NS	NS	NS
time served of current sentence ( $n = 369$ ) <sup>b</sup>	NS	NS	NS
number of previous sentences	NS	NS	$r = 0.11^*$
total time served	NS	NS	$r = 0.09^*$
ever charged with drug offence	$t = 2.29^*$	NS	NS

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

<sup>a</sup>Due to missing data, sample size may not equal 559 for each variable.

<sup>b</sup>Sample size for length of sentence and time served of current sentence equals 369 due to exclusion of remand prisoners.

**Table II.** Association between prisoners' AIDS awareness and HIV/AIDS knowledge ( $n = 559$ )<sup>a</sup>

	Knowledge (correct responses)	Knowledge gaps (don't know responses)	Misinformation (incorrect responses)
Had HIV test	$t = 3.00^{**}$	$t = -2.81$	NS
Know someone HIV test	$t = 3.81^{***}$	$t = -2.67^{**}$	$t = -2.00^*$
Know someone HIV positive	$t = 2.83^{**}$	$t = -2.71^{**}$	NS
Know someone with AIDS	NS	NS	NS
Perceived risk of AIDS inside prison	$F = 6.96^{***}$	NS	$F = 12.3^{***}$
Perceived risk of AIDS outside prison	NS	NS	NS
Most knowledge inside/outside ( $n = 482$ ) <sup>b</sup>	$t = -2.38^*$	$t = 3.27^{**}$	NS
Source of most information	NS	NS	NS
Seen prison video	$t = 2.33^*$	NS	$t = 2.23^*$

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

<sup>a</sup>Due to missing data, sample size may not equal 559 for each variable.

<sup>b</sup>Sample size for where obtained most knowledge excludes 77 prisoners who indicated knowledge obtained from inside and outside prison equally.

questionnaire. However, prisoners with educational qualifications performed better than prisoners without qualifications. Those who had educational qualifications obtained a higher knowledge score and low misinformation score than prisoners without qualifications (means: correct: 'A' Level or higher qualification = 37.0; 'O' Level = 34.2; CSE or no qualifications = 32.4, post-hoc Scheffe,  $P < 0.05$ ; errors: 'A' Level or higher qualifications = 6.6; 'O' Level = 8.0; CSE or no qualifications = 9.2, post-hoc Scheffe,  $P < 0.05$ ). Older prisoners performed poorly in that a higher misinformation score was associated with greater age [ $r(557) = 0.12, P < 0.01$ ].

With regard to imprisonment characteristics the greater the total length of time imprisoned and the greater the total number of previous sentences, the poorer the level of performance, in that there were

positive correlations between misinformation score and each of these factors [ $r(556) = 0.09, P < 0.05$  and  $r(556) = 0.11, P < 0.05$ ] respectively. In addition, those who had ever been charged with a drug offence were more knowledgeable than those who had never been charged with a drug offence [means: previous drug charge = 34.1; no previous drug charge = 32.6,  $t(557) = 2.29, P < 0.05$ ]. Length of current sentence and time served of current sentence were not associated with performance on the HIV/AIDS questionnaire.

### AIDS awareness

A number of aspects of HIV/AIDS awareness were associated with overall performance. Higher levels of knowledge, reflected in higher number of correct scores, were associated with those prisoners who had taken an HIV antibody test [means: taken HIV

Table III. Association between prisoners' sexual and drug injecting behaviours and HIV/AIDS knowledge ( $n = 559$ )<sup>a</sup>

	Knowledge (correct responses)	Knowledge gaps (don't know responses)	Misinformation (incorrect responses)
<b>Sexual behaviours</b>			
number of partners ( $n = 543$ ) <sup>b</sup>	NS	NS	NS
used condoms ( $n = 529$ ) <sup>c</sup>	NS	NS	$t = 2.19^*$
selected partners ( $n = 404$ ) <sup>d</sup>	NS	NS	$t = 5.08^{***}$
reduced partners	NS	$t = -2.98^{**}$	$t = 3.39^{**}$
intend to use condoms on release ( $n = 553$ ) <sup>e</sup>	NS	NS	NS
<b>Injecting drug behaviours</b>			
ever injected drugs	$t = 4.50^{***}$	$t = -2.66^{**}$	$t = -3.00^{**}$
partner ever injected ( $n = 543$ ) <sup>b</sup>	$t = 3.38^{**}$	$t = -2.32^*$	NS
shared works ( $n = 154$ ) <sup>f</sup>	NS	NS	NS
sterilized works ( $n = 87$ ) <sup>g</sup>	NS	NS	NS
injected drugs in prison ( $n = 159$ ) <sup>h</sup>	NS	NS	NS
intend to inject drugs on release ( $n = 159$ ) <sup>h</sup>	NS	NS	NS

\* $P < 0.05$ ; \*\* $P < 0.01$ ; \*\*\* $P < 0.001$ .

<sup>a</sup>Due to missing data, sample size may not equal 559 for each variable.

<sup>b</sup>Sample size for number of partners, anal intercourse and partner ever injected equals 543 due to exclusion of sexually inexperienced prisoners.

<sup>c</sup>Sample size for used condoms equals 529 due to additional exclusion of prisoners who had not been at liberty since outbreak of AIDS.

<sup>d</sup>Sample size for selected partners and reduced partners equals 404, due to additional exclusion of prisoners in monogamous long-term relationships.

<sup>e</sup>Sample size for intended to use condoms after release equals 553, due to exclusion of prisoners who intended to refrain from all sexual activity.

<sup>f</sup>Sample size for shared works equals 154 (total number of injecting drug users).

<sup>g</sup>Sample size for sterilized works equals 87 (subsample of injecting drug users reporting having shared equipment,  $n = 97$ ).

<sup>h</sup>Sample size for injected drugs in prison and intend to inject drugs on release equals 159 (total injecting drug users).

test = 34.4; not taken HIV test = 32.6,  $t(557) = 3.00$ ,  $P < 0.01$ ]; know somebody who had taken an HIV test [means: know somebody = 33.6; do not know somebody = 31.3,  $t(557) = 3.81$ ,  $P < 0.01$ ]; know somebody who was HIV seropositive [means: know somebody = 33.6; do not know somebody = 32.0,  $t(557) = 2.83$ ,  $P < 0.01$ ]; perceived themselves to be at low/no risk of HIV/AIDS inside prison as opposed to being at medium or high risk (means: no risk = 34.2; medium risk = 30.9; high risk = 30.1, post-hoc Scheffe  $P < 0.05$ ); had obtained most of their HIV/AIDS knowledge outside prison as opposed to inside prison [means: outside = 33.7; inside = 32.4;  $t(480) = 2.38$ ,  $P < 0.05$ ]; and had seen the Home Office inmate prison video [means: seen video = 33.5; not seen video = 32.3,  $t(557) = 2.33$ ,  $P < 0.05$ ].

Prisoners who had more knowledge gaps had not taken an HIV antibody test [means: taken HIV test = 5.0; not taken HIV test = 6.6,  $t(557) = 2.81$ ,  $P < 0.01$ ]; did not know someone who had taken an HIV antibody test [means: know somebody = 5.8; do not know somebody = 7.3,  $t(557) = 2.67$ ,  $P < 0.01$ ]; did not know someone who was HIV seropositive [means: know somebody = 5.7; did not know somebody = 7.1,  $t(557) = 2.71$ ,  $P < 0.01$ ]; and had obtained most of their HIV/AIDS information inside prison [means: inside = 7.0; outside = 5.4,  $t(480) = 3.27$ ,  $P < 0.01$ ].

Prisoners who had the highest misinformation scores did not know someone who had taken an HIV antibody test [means: know somebody = 8.6; do not know somebody = 9.4,  $t(557) = 2.00$ ,  $P < 0.05$ ]; perceived themselves to be at very high, high, or medium risk as opposed to low/no risk HIV/AIDS inside prison (means: very high risk = 13.2; high = 12.6; medium = 9.9; low/no risk = 8.0, post-hoc Scheffe  $P < 0.05$ ); and had not seen the Home Office inmate prison video [mean: seen video = 8.4; not seen video = 9.3;  $t(557) = 2.23$ ,  $P < 0.05$ ].

### Sexual and drug behaviour

Sexual behaviour variables were not associated with level of HIV/AIDS knowledge. However,

prisoners who had reduced their number of sexual partners as a means of HIV risk reduction had fewer knowledge gaps [means: reduced partners = 5.4; not reduced partner = 7.1,  $t(402) = 2.98$ ,  $P < 0.01$ ] but higher misinformation scores [means: reduced partners = 9.5; not reduced partners = 8.1,  $t(402) = 3.39$ ,  $P < 0.01$ ]. Higher misinformation scores were also found among prisoners who, as a means of HIV risk reduction, had used condoms [means: used condoms = 9.7; not used condoms = 8.5,  $t(527) = 2.19$ ,  $P < 0.05$ ] and who selected their partners more carefully [means: selected more carefully = 9.8; not selected more carefully = 7.6,  $t(402) = 5.08$ ,  $P < 0.001$ ].

With regard to drug behaviour, prisoners who had injected at some time had higher knowledge scores [means: injected = 34.9; not injected = 32.3,  $t(557) = 4.50$ ,  $P < 0.001$ ] and lower misinformation scores [means: injected = 5.2; not injected = 6.6,  $t(557) = 2.66$ ,  $P < 0.01$ ]. Having had a sexual partner who was also a drug injector was associated with higher knowledge scores [means: partner injected = 34.7; partner not injected = 32.7,  $t(541) = 3.38$ ,  $P < 0.01$ ] and fewer knowledge gaps [means: partner injected = 5.2; not injected = 6.5,  $t(541) = 2.32$ ,  $P < 0.05$ ].

## Discussion

The present study has a number of methodological weaknesses. For example, the knowledge questionnaire used in this study was based on similar questionnaires used by Zimmerman *et al.* (1991) and Celentano *et al.* (1990) and, like virtually all other knowledge questionnaires applied in prison settings, has not been subjected to the rigours of questionnaire and scale design, including validity and reliability test procedures. Furthermore, the correlates of HIV/AIDS knowledge are here represented in relation to the total 48-item questionnaire rather than each of the six content areas. Analyses of correlates of each of the six content areas would enable health educators to identify very particular gaps in different inmates' knowledge of HIV/AIDS, e.g. knowledge of high risk modes of

transmission versus knowledge of methods of preventing HIV transmission. However, conducting analyses of each of the six individual content areas would have resulted in a substantial increase in length and complexity of this paper without necessarily enhancing clarity.

Another issue that needs to be addressed is the division of knowledge scores into 'correct', 'incorrect' and 'don't know' responses. One might argue that the three scores are in fact linearly dependent since knowing any two scores means that one can compute the third, and therefore multivariate rather than univariate tests should have been used. From a purist statistical perspective this is a valid point. However, we would argue that the use of the three scores is justified due to each score's unique implication and distinct conceptual importance for education. Someone who has a gap in their knowledge would require a different educational approach from someone who has a false belief as part of their 'knowledge'. Nevertheless, one must be cautious when multiple testing of the same sample does occur and we would therefore suggest that the statistical significance of associations at probability levels above 0.001 should be interpreted cautiously.

The present study illustrates that high levels of HIV-related knowledge are associated with specific factors, e.g. a history of drug offences, having had an HIV test, knowing someone who has had an HIV test, knowing someone who is HIV seropositive, a history of injecting drug use and having a sexual partner who is also an injecting drug user. These results are similar to those found in a study which assessed the factors associated with inmates' self-perceived HIV vulnerability or risk prior to imprisonment (Power *et al.*, 1994). In this latter study it was found that those prisoners who thought their risk of HIV infection was high prior to imprisonment were also more likely to have been previously charged and sentenced with a drug offence, to have used injected drugs and shared needles in and out of prison, to have had an HIV test, known someone who was HIV seropositive, to have had an injecting drug user sexual partner, and to have had more than one sexual partner in the month prior to

custody. The results from these two studies suggest that those inmates who are objectively at high risk of contracting HIV by virtue of their drug injecting and sexual behaviour are also amongst the most knowledgeable inmates with regard to HIV/AIDS and are able to apply their understanding of risk factors for HIV infection to themselves in assessing their own level of HIV vulnerability. Unfortunately, such knowledge and self-perceived risk does not necessarily result in the adoption of risk reduction behaviours. Appropriate knowledge regarding vulnerability, susceptibility and means of reducing risk are seen as central components of many models of health behaviour, such as the Health Belief Model (Rosenstock, 1974) and Protection Motivation Theory (Rogers, 1975). However, these models also emphasize the need to tackle potential barriers or negative consequences associated with the adoption of health promoting behaviour. An example provided by prisoners of potential barriers is that 'condom use reduces sexual pleasure'; an example of negative consequences is that 'refusal to share other injectors' injecting equipment implies that they are HIV seropositive'. It is in these areas, with regard to potential HIV transmission amongst prisoners that health education must now be focused.

The Scottish Prison Service is presently evaluating the introduction of a methadone substitution programme. Nevertheless, outbreaks of hepatitis B and potential HIV transmission associated with the sharing of unsterilized injecting equipment occur intermittently (Christie, 1993). Prisoners with the most HIV-related knowledge continue to be those who appear to exhibit the most risky HIV-related behaviour. Whilst it appears that many prisoners have modified their HIV-related risk behaviours, a small proportion have not responded accordingly (Power *et al.*, 1992a,b, 1993). Further HIV/AIDS mass education programmes aimed solely at enhancing knowledge are arguably unlikely to modify the behaviour of this subgroup of individuals. More intensive, individually tailored or group-orientated programmes are required for those who are not highly motivated to alter their risk behaviour. Greater efforts are required to identify the stum-



bling blocks that inhibit the adoption of risk reduction strategies and the factors that initiate and promote risk reduction behaviours. For example, one of the main determinants of injecting drugs during imprisonment is injecting at around time of custody. It is therefore crucial when prisoners are interviewed at time of reception into custody that barriers or obstacles that may inhibit a prisoner from admitting to having a recent history of injecting drug use are removed.

The present study only presents information from inmates in Scottish prisons, and similar results and relationships should not necessarily be assumed to apply amongst other prison populations. Nevertheless, some similarities do exist with the present study results and those of the Irish studies conducted by O'Mahoney and his colleagues. For example, in both sets of studies those prisoners with formal educational qualifications had higher HIV knowledge levels than prisoners who were less well educated. It would be of interest if future studies in this area were able to undertake more detailed cross-cultural comparisons. The present study illustrates that prisoners are not a homogeneous mass in relation to their levels of HIV/AIDS knowledge and related characteristics. With regard to information regarding HIV transmission, effectiveness of risk reduction strategies, etc., it is likely that different groups of inmates are likely to have different educational needs. Whilst it is important that the educational needs of specific inmate subgroups are adequately assessed, the present study suggests that certain inmate characteristics may provide an indication of the type of information deficits or strengths that are likely to exist. However, the relationship between inmate characteristics and HIV/AIDS knowledge profiles amongst groups of prisoner does not enable us to predict knowledge levels on an individual basis. It is impossible to draw any firm conclusions from the present study regarding HIV/AIDS education needs in the wider community. However, one might speculate that the diversity of issues affecting HIV/AIDS knowledge and the adoption of preventative risk behaviours among prison populations is likely to be even more complex in the population at large.

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## Appendix

### Content area 1

- (1) Many people who are already infected with HIV look and feel perfectly healthy (T).
- (2) People who are infected with HIV but have not developed the symptoms of AIDS cannot pass on the virus to other people (F).
- (3) HIV causes AIDS by breaking down the infected person's natural ability to fight off diseases (T).
- (4) Having AIDS and being infected with HIV are the same thing (F).
- (5) An HIV infected person does not need to have any of the symptoms of AIDS in order to infect others (T).
- (6) If a person has only recently been infected with HIV this may not show up in an HIV antibody test (T).
- (7) The HIV antibody test result shows when a person will develop AIDS (F).
- (8) HIV positive antibodies are a protection against contracting AIDS (F).

### Content area 2

- (1) Hepatitis B is transmitted more easily than is HIV/AIDS (T).
- (2) In 1988, more people died of lung cancer than died of AIDS in the UK (T).
- (3) The average person is more likely to be involved in a serious road traffic accident than contract HIV/AIDS (T).
- (4) Up to now, fewer than 5000 people have died of AIDS in the UK (T).
- (5) The average person has a greater than 50% chance of becoming infected with HIV in their lifetime (F).
- (6) The number of people infected with HIV (but without AIDS) in the UK at present has been estimated to be in excess of 900 000 (F).
- (7) Worldwide, a total of approximately 120 000 cases of AIDS have been reported to date (F).
- (8) Approximately 10 000 cases of AIDS have been reported in the UK to date (F).

### Content area 3

- (1) HIV/AIDS can be transmitted between men who have anal intercourse (T).

- (2) A man can become infected with HIV/AIDS by having vaginal intercourse with an infected woman (T).
- (3) HIV/AIDS can only be transmitted between adults by an exchange of bodily fluids, such as blood or semen (T).
- (4) HIV/AIDS cannot be transmitted between people who only share needles/syringes occasionally (F).
- (5) So long as they don't inject drugs themselves, the sexual partners of IV drug users have a very low risk of becoming infected with HIV/AIDS (F).
- (6) A man cannot become infected by HIV/AIDS by having anal intercourse with a woman (F).
- (7) HIV/AIDS is only passed on when it manages to get directly into the bloodstream (T).
- (8) If IV drug users avoid sharing needles/syringes, they can share other items of injecting equipment (e.g. cooking-up spoons) with no risk of becoming infected with HIV (F).

### Content area 4

- (1) A person can become infected with HIV/AIDS by shaking hands or hugging someone who is infected with HIV/AIDS (F).
- (2) People can become infected with HIV/AIDS by regularly sharing plates, cups or cutlery with someone who is infected with HIV/AIDS (F).
- (3) If you kiss someone on the mouth who is infected with HIV/AIDS you will also become infected (F).
- (4) People can become infected with HIV/AIDS by swimming in the same pool as an infected person (F).
- (5) A person can become infected with HIV/AIDS by eating food prepared by someone who is HIV infected (F).
- (6) People cannot become infected with HIV/AIDS by sitting on a toilet seat which has previously been used by a person who is infected with HIV/AIDS (T).
- (7) You cannot become infected with HIV/AIDS by breathing in air in which someone with HIV/AIDS has sneezed or coughed (T).
- (8) Medical staff who regularly treat IV drug users are at a very high risk of becoming infected with HIV/AIDS (F).

### Content area 5

- (1) You can reduce your chance of contracting HIV/AIDS by reducing your number of sexual partners (T).
- (2) By keeping a complete set of works for their own exclusive use, intravenous drug users can protect themselves from HIV/AIDS (T).
- (3) You can reduce the risk of contracting HIV/AIDS by using a condom every time you have sexual intercourse (T).
- (4) People can effectively protect themselves from HIV/AIDS by only having sex with people who look fit and healthy (F).
- (5) Having sexual intercourse with partners of the opposite sex is an effective way by which people can protect themselves from HIV/AIDS (F).
- (6) Intravenous drug users can protect themselves from HIV/AIDS by rinsing out shared works with water before using them (F).
- (7) Intravenous drug users can reduce their chances of contracting HIV/AIDS by soaking previously used works in a solution of bleach before re-using them (T).

(8) Having vaginal rather than anal sexual intercourse is an effective way of preventing transmission of HIV/AIDS between people (F).

**Content area 6**

- (1) You run a high risk of becoming infected with HIV/AIDS by sitting beside an HIV/AIDS infected inmate (F).
- (2) You run a high risk of becoming infected with HIV/AIDS by sharing clothes with an HIV/AIDS infected inmate (F).
- (3) You run a high risk of becoming infected with HIV/AIDS if you use a cell previously used by an HIV/AIDS infected inmate (F).

- (4) You run a high risk of becoming infected with HIV/AIDS if an HIV/AIDS infected person spits or vomits on you (F).
- (5) You run a high risk of becoming infected with HIV/AIDS if an HIV/AIDS infected person throws their urine or shit on you (F).
- (6) You run a high risk of becoming infected with HIV/AIDS if an HIV/AIDS infected person throws her sanitary towel at you (F).
- (7) You run a high risk of becoming infected with HIV/AIDS if an infected person bites you (F).
- (8) You run a high risk of becoming infected with HIV/AIDS during a fight with an HIV/AIDS infected inmate (F).

