Epidemiology and Psychiatric Sciences (2016), **25**, 150–159. © Cambridge University Press 2015
doi:10.1017/S2045796015000062

ORIGINAL ARTICLE

Prisoners at ultra-high-risk for psychosis: a cross-sectional study

M. Jarrett[1,2*], L. Valmaggia[1,2], J. Parrott[3], A. Forrester[1,2], T. Winton-Brown[1,2], H. Maguire[4], D. Ndegwa[2], P. McGuire[1,2] and T. K. J. Craig[1,2]

[1] *King's College London, Institute of Psychiatry, London, UK*
[2] *South London and Maudsley NHS Trust, London, UK*
[3] *Oxleas NHS Trust, Essex, UK*
[4] *Hellingly Medium Secure Unit, Sussex Partnership NHS Foundation Trust, Hellingly, UK*

Background. The definition of ultra-high risk (UHR) for psychosis was derived from community-based help-seeking populations. Prisoners have high rates of psychosis and other severe mental health (MH) problems. They also have high rates of risk factors for psychiatric morbidity and yet they are among the populations who are less likely to seek help in the community. Despite a policy of equivalence of care for individuals in prison there are no early intervention services for psychosis in prisons in the UK. This was a study exploring feasibility of introducing such a service into a local London prison. This paper discusses the differences in MH profile of prisoners who met criteria for at-risk mental state compared with those who did not.

Method. A two-stage procedure was used. Participants in a local London prison were routinely screened in the first week of arrival in prison with the Prodrome Questionnaire – Brief Version (PQ-B; Loewy *et al.* 2011). Those that screened positive as well as a small sample of those who screened negative underwent a further semi-structured assessment to see whether they met criteria for UHR state. Data on self-harm and suicide attempt, family psychiatric history, and anxiety and depression was also collected.

Results. A total of 891 prisoners were screened, 44% of whom screened positive. A total of 354 underwent second stage assessment, 60 of whom had screened negative. Four groups were identified: those that had no MH problems, a group experiencing First Episode Psychosis, those at UHR of psychosis and a group with other MH problems. The UHR state and Psychotic groups had very similar MH profiles of symptoms and distress. Prisoners with no MH problems were at the other end of the spectrum with few symptoms and little distress. The Other group fell in between this group and the psychotic spectrum group in terms of symptomology and distress.

Conclusions. This study is the first to examine risk for psychosis in an adult male prison population. We identified a broad spectrum of MH disorder for which there is little current service provision in prisons. Screening early in the custodial process has the potential to identify unmet MH need and has implications for keeping individuals safe in custody. A long-term strategic approach is required to address MH need in prisons.

Received 16 July 2014; Revised 05 January 2015; Accepted 06 January 2015; First published online 3 March 2015

Key words: Mental health, prisoners, psychosis, ultra-high risk.

Introduction

Research into the high risk state for psychosis has evolved internationally over the past two decades (Fusar-Poli *et al.* 2012*a*, *b*; Lin *et al.* 2012). Services now exist across the world to detect and treat individuals with a view to prevent transition to psychosis and to improve prognosis when prevention is not possible (McGorry *et al.* 2013). However, these services draw from a highly selective sample of help-seeking populations and the associated findings of symptom profile and risk for transition is therefore biased (Fusar-Poli *et al.* 2013). However, there are various consistent factors that are influential in whether and when individuals seek help for mental health (MH) problems (e.g., male gender, McKenzie *et al.* 2006; younger age, McKenzie *et al.* 2006; Black ethnicity, Morgan *et al.* 2005). Prisoners are a population that despite high levels of mental and physical health problems, do not routinely access services of National Health Service (NHS) outside the prison (Harty *et al.* 2003; Department of Health, 2002). This study sought to establish the prevalence and correlates of routinely

* Address for correspondence: M. Jarrett, Health Service and Population Research Department, Institute of Psychiatry, King's College London, De Crespigny Park, London S5 8AF, UK.
(Email: manuela.jarrett@kcl.ac.uk)

screened prisoners at ultra-high risk (UHR) for psychosis. In a previous paper, we have reported on a 5% prevalence of at-risk mental state (ARMS) in the prison population (Jarrett *et al.* 2012). In this paper, we describe the demographic and other characteristics of prisoners with an ARMS compared with those not at risk of psychosis and psychosis.

The prevalence of psychosis is high in prison populations (Birmingham *et al.* 1996; Singleton *et al.* 1998; Shaw *et al.* 2009). A meta-analysis comparing prevalence of psychosis from a national survey of householders (Meltzer *et al.* 1995) with a national survey of prisoners (Singleton *et al.* 1998), found a difference in prevalence of 5.2% for the prison group *v.* 0.4% for the community group (Brugha *et al.* 2005). Prisoners also have high rates of some of the associated risk factors for psychosis such as substance misuse (National Treatment Agency for Substance Misuse, 2012), childhood adverse events (Williams *et al.* 2012*a*) and social exclusion (Williams *et al.* 2012*b*).

This project came about as a local response to the transformation of healthcare services within the prison service and the NHS mandate to deliver the principle of equivalence of care. While mainly concerned with the treatment for established mental illness with custodial settings, there may also be room for more innovative approaches, including services such as the Outreach and Support service in South London (OASIS) that provides the early detection and treatment for people who are UHR for psychosis (Fusar-Poli *et al.* 2012*a*). However, before introducing such a service, it is essential to assess the feasibility of identifying the UHR in a prison setting and this brings challenges that should not be underestimated. The study by the Office of National Statistics of prison populations (Singleton *et al.* 1998) showed a high prevalence of co-morbidity with a third of male prisoners having three mental disorders, with overlapping symptoms that can make UHR detection challenging. Approximately 29% of male prisoners meet criteria for paranoid personality disorder, 30% for borderline personality disorder, 4% meet criteria for post-traumatic stress disorder, 20% for anxiety disorders (generalised anxiety and obsessive compulsive disorder), 50% abuse alcohol and 60% have substance misuse issues. In addition, 80% of the prisoners have a reading age of 11 years or less, which means at times it is difficult for them to identify and describe their feelings and thoughts clearly.

This paper compares the social and clinical profiles of prisoners at high risk of psychosis to that of prisoners with no mental disorder, other mental disorder and psychosis. Ethical approval for the study was granted by Essex 2 Research Ethics Committee (REC: 08/H0302/118).

Method

Setting

The study took place between February 2009 and December 2011 in a London local prison, which has a capacity for approximately 800 male prisoners aged 21 and over. Prisoners, at the time, were either awaiting trial or serving short sentences, and the average length of stay in the prison was 3 months. Local prisons (also known as remand prisons) serve the courts and hold prisoners who are awaiting trial or serving short sentences (usually 2 years or less). All prisoners will first go to a local prison from court before going to other establishments. The site was deliberately chosen to capture the population who are coming to prison from the community rather than being transferred from other jails where they will have had an opportunity to adjust to being in custody. These prisons take 'new receptions' (individuals who have been in prison before but are coming in for a 'new' term) and also 'first receptions' (individuals coming to prison for the first time). Local prisons have the highest turnover of any type of prison. Approximately 15% of the prisoner population is made up of remand prisoners. Once a prisoner is sentenced, if they receive a sentence of longer than 2 years, he will be sent to a training prison.

Procedure

The daily reception register was surveyed every day by a researcher (MJ). Prisoners who met inclusion criteria were approached and recruited if they were able to provide oral and written informed consent. Screening was carried out face-to-face. Details of the procedure can be found in Jarrett *et al.* (2012). All participants who screened positive were asked to take part in a further semi-structured interview with a clinician to establish whether they met the diagnostic criteria for being UHR for psychosis. A total of 60 prisoners who screened negative were also randomly selected for the face-to-face interview to test face validity of the Prodrome Questionnaire-Brief Version (PQ-B). The clinician conducting the follow-up interview was blind to the outcome of the screening. This procedure resulted in four groups – participants who had already developed a psychotic illness (First Episode Psychosis), others who met criteria for UHR for psychosis as measured by the Comprehensive Assessment for At-Risk Mental State (CAARMS) interview, yet others who were positive at screening but did not meet CAARMS criteria for UHR, but had other non-psychotic MH problems (Other), and finally a group that at both screen and CARRMS were found to have no MH issues (no MH problem).

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

Sample

Prisoners newly received from the courts who lived in the catchment area of South London and Maudsley Foundation Trust (SLAM), aged 21–40 years, were approached for recruitment. Prisoners with a previous history of psychosis, who had been transferred from other prisons, or with insufficient English to be assessed with the screening structured interview were excluded.

Materials

The following measures were collected during the screening stage:

Demographics: age, employment, qualifications, ethnicity, accommodation; and family psychiatric history, legal status (awaiting trial or convicted), first time in prison or returning to prison

Depression, Anxiety, Self-Harm and/or Suicide Attempts: A self-rating between 0 (not at all) and 10 (extremely) for depression and anxiety. The aim was to gauge mood as we were assessing in the first week of reception, known to be a time to be of high distress and suicide attempts (Shaw *et al.* 2004). We also asked the participant whether they had ever (i) self-harmed and/or (ii) attempted suicide. If either of these questions were endorsed, information was sought on (i) most recent incident (ii) age at first incident and (iii) overall number of incidents for each. This allowed us to identify risk and implement safer custody procedures as appropriate.

Screening tool

The Prodromal Questionnaire – Brief Version (Loewy *et al.* 2011): A 25-item questionnaire designed to identify people with an ARMS. Each question elicits a yes/no answer. On endorsement, a follow-up question asks how strongly the participant agrees that the experience causes concern or problems. Sensitivity and specificity of the questionnaire in the prison population is described in more detail in Jarrett *et al.* (2012).

Second-stage face-to-face assessment

Comprehensive Assessment of At-Risk Mental State (Yung *et al.* 2005): A semi-structured interview schedule with eight subscales each with a rating of 0–6. The scale scores threshold and frequency of symptoms, distress caused by symptoms and whether they occur in the context of substance misuse. Criteria for ARMS are based on the scoring of the four Positive Symptoms Scales (encompassing Unusual Thought Content, Non-Bizarre Ideas, Perceptual Abnormalities and Disorganised Speech). Owing to the time restrictions in the prison, we therefore limited the assessment to the use of the Positive Symptoms Scale, and to four of the sections within the General Psychopathology Scale (Mania, Depression, Anxiety and Self-Harm and Suicidality).

Yung & McGorry (1996) and Yung *et al.* (2005) have defined UHR criteria for an ARMS as meeting at least one of three other criteria combined with a significant drop in functioning or chronic low functioning (score of ≤ 50 over 12 months or 30% drop in functioning in the last year, sustained for more than a month) as:

(i) first degree relative with psychosis or schizotypal personality disorder; and/or

(ii) attenuated psychotic symptoms defined as a minimum score of three each on both intensity and frequency on any of the Positive Symptoms Scales; and/or

(iii) a psychotic episode lasting 7 days or less that resolves itself spontaneously.

Symptoms should occur at least sometimes outside of the context of substance use or withdrawal.

In the community, this criteria is targeted at individuals who are in the peak age group thought to be associated with first episode psychosis (14–35 years). In the prison, we targeted the youngest receptions (aged 21) and included individuals up to age 40 in the few months before lowering the age limit to 35 to be in line with the community team.

Social and occupational functioning assessment scale (SOFAS; Goldman *et al.* 1992): Derived from the Global Assessment of Functioning scale, the SOFAS rates social functioning from 0 (unable to function without support) to 100 (good functioning in all areas).

Analyses

IBM SPSS Statistics Version 19.0 was used to analyse the data. *T*-tests were used to compare age. The Mann–Whitney *U* tests were used to compare all other continuous variables as they did not meet parametric assumptions of normality and homogeneity of variance. Chi-squared analyses were used for categorical variables.

Results

The flow of participants in the study is shown in Fig. 1. Of the 891 individuals PQ screened, 401 participants screened positive. Of these, seven were found to be

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

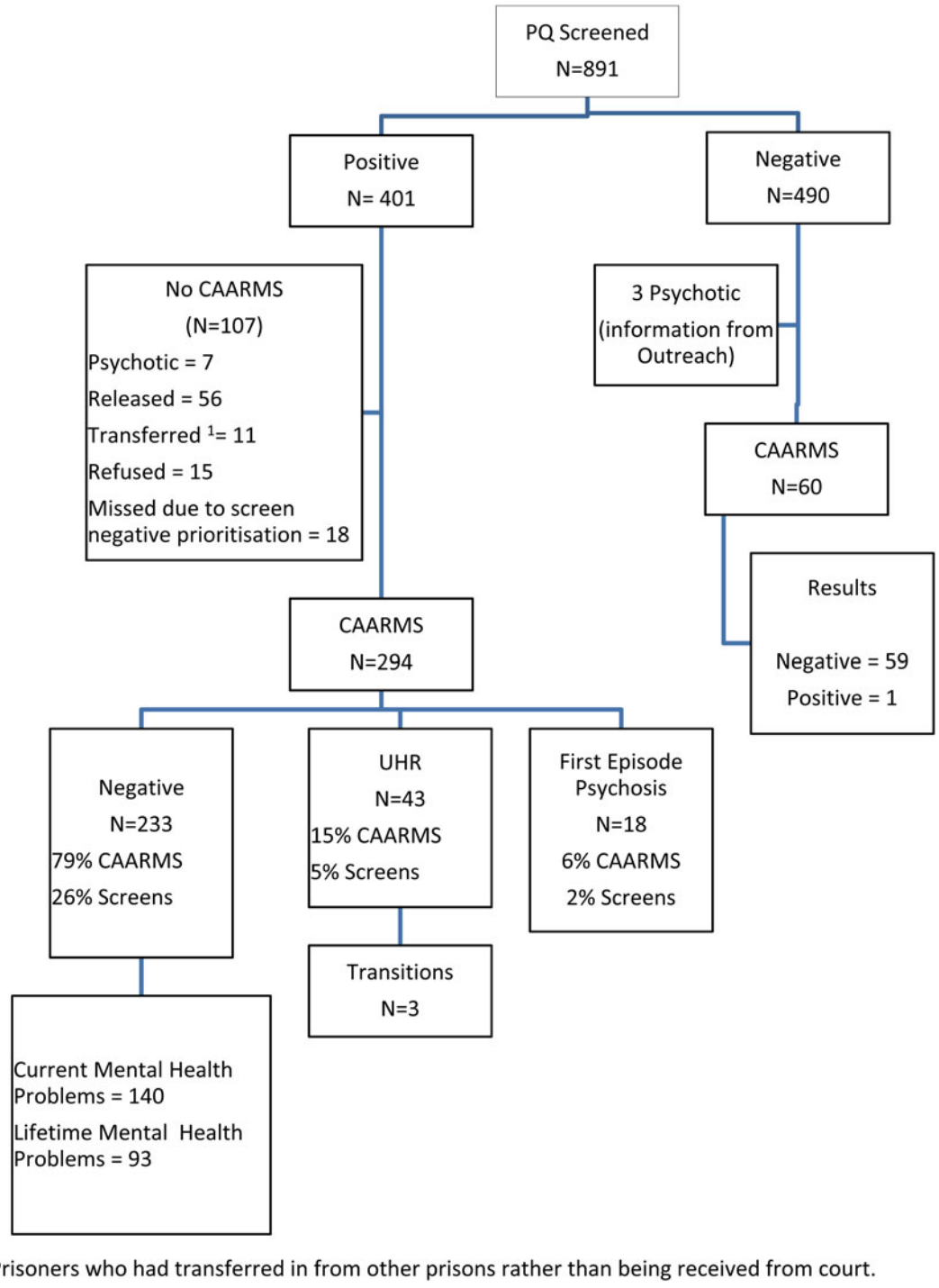

Fig. 1. Consort Chart Screens to CAARMS Outcome.

psychotic at screen and were therefore referred to prison MH services. These seven consequently did not undergo further assessment. A further 100 participants were not assessed with the CAARMS because they (i) were released ($N = 56$), (ii) transferred to other prisons ($N = 11$) before they could be seen, (iii) refused ($N = 15$) and were missed due to lack of time ($N = 18$). This left 294 who underwent the second stage (CAARMS) interview. In order to provide a screen-negative comparison group for CAARMS interview we selected a random sample of 60 participants who screened negative. Clinicians carrying out the CAARMS interviews were blind to screen results of the participants they were assessing. Of the

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

Table 1. *Demographic Characteristics (comparison of each group with UHR group)*

	No MH problem	Other	UHR	FEP	NMHP *v.* UHR	O *v.* UHR	FEP *v.* UHR
	Mean (S.D.)				*p*		
Age*	28.9 (5.0)	28.3 (5.2)	27.5 (5.8)	27.7 (5.6)	0.21	0.34	0.89
Age education ended	16.7 (3.3)	16.1 (3.4)	15.8 (2.9)	16.4 (3.8)	0.15	0.55	0.48
		N (%)					
Ethnicity							
White	17 (28)	88 (38)	17 (39)	5 (20)	0.18	0.98	0.21
Black	36 (61)	104 (45)	19 (43)	16 (64)			
Other	6 (10)	41 (18)	8 (18)	4 (16)			
No qualifications	13 (22)	78 (36)	22 (50)	9 (36)	**0.003**	**0.04**	0.26
Unemployed	30 (51)	140 (60)	28 (64)	17 (68)	0.21	0.66	0.72
Short-term accommodation	19 (32)	90 (39)	20 (46)	15 (60)	0.17	0.41	0.25
Homeless before prison	1 (2)	26 (11)	8 (18)	5 (20)	**0.003**	0.19	0.85
First time in prison	20 (34)	49 (21)	9 (21)	5 (20)	0.13	0.91	0.96
Awaiting trial	35 (59)	138 (59)	20 (46)	21 (84)	0.16	0.09	**0.002**

*40 of 891 Offenders aged ≥36 years.
Bold values included are significant at $p \leq 0.05$.

screen-negative participants, just one was found to be positive for UHR for psychosis.

The most common reasons for refusal to undergo CAARMS were 'not being in the mood to answer more questions', and feeling they would not benefit from participating as they did not think they had any MH problem. Of the 354 participants who completed the CAARMS, 292 were found negative for ARMS, 44 were positive (including the one person who had screened negative), and 18 were found to be already psychotic. For the purposes of analyses the seven individuals found to be psychotic at the first stage screen were included in the final analyses making the total number of people in the psychotic group 25. The 44 people who met criteria for ARMS all did so, on the basis of attenuated symptoms, in addition to which four participants also had a first degree family history of psychosis.

Characteristics and clinical profile were compared across the four groups: No MH Problem, Other, UHR and First Episode Psychosis.

Demographic profile

Table 1 shows the demographic data for the groups. There was no difference between the groups in mean age, age at which individuals left full-time education, ethnicity, levels of unemployment, being in short-term accommodation prior to reception or being in prison for the first time. The UHR group were, however, significantly more likely to have no qualifications than either the No MH Problem or the Other groups. They were also more likely to have been homeless before prison compared with these groups. With regard to whether they were awaiting trial or convicted, the UHR group had the lowest proportion of participants who were awaiting trial and the First Episode Psychosis group had the highest. The difference between the two was statistically significant.

Clinical profile

Screening and CAARMS

Analyses were carried out of MH variables examining differences between each group and the next. Table 2 shows the differences between the groups for endorsement and distress on PQ-B items. The No MH Problem group endorsed significantly fewer items than the Other group who in turn endorsed significantly fewer items than the UHR group. The UHR and First Episode Psychosis groups did not differ significantly either in the median number of PQ-B items endorsed or pattern of distress.

Data from the CAARMS are also shown in Table 2. Participants can be rated between 0 (no symptom) to 6 (Psychotic) on each scale for intensity. The scales also give a frequency rating ranging for 0 (not present at all) to 6 (continuous). The total scores were summed for the four positive scales on severity and then again on frequency. The table shows the median scores

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

Table 2. *Endorsement of PQ-B Items and CAARMS Symptom Scales Scores*

	No MH problems ($N = 59$)	Other ($N = 233$)	UHR ($N = 44$)	FEP ($N = 25$)	NMHP *v.* O	O *v.* UHR	UHR *v.* FEP
	Mean (S.D.)				*p*		
Number of items endorsed	1 (0–3)	12 (8–19)	17 (10–23)	21 (14–24)	0.000	0.005	0.10
Number of items with distress	0 (0–1)	6 (3–12)	10 (7–16)	12 (7–16)	0.000	0.001	0.57
		Median (interquartile range)					
		Positive symptom				*p*	
Severity	0 (0–1)	3 (0–5)	10 (7–14)	17 (10–20)	0.000	0.000	0.000
Frequency and duration	0 (0–2)	4 (0–7)	11 (8–15)	13 (10–18)	0.000	0.000	0.03
		General psychopathology					
Severity	0 (0–2)	2 (0–5)	4 (0–7)	5 (0–9)	0.000	0.02	0.52
Frequency and duration	0 (0–2)	2 (0–6)	5 (0–7)	6 (0–9)	0.000	0.07	0.29

for each group with the inter-quartile range in brackets in the first set of brackets and the total range in the second set of brackets. The No MH Problem group differed significantly from the Other group on both severity and frequency for positive and general psychopathology items. The Other group in turn differed from the UHR group in terms of positive symptom scales which is to be expected since by definition the CAARMS distinguishes the individuals who are on the psychotic spectrum to those who are not based on these scales. However, 33 individual from the Other group met criteria on the positive scales but not the functioning criteria. The two groups differed in terms of clinical ratings for general psychopathology, although this fell short of statistical significance. The First Episode Psychosis group score significantly higher also on the positive symptom scales (as would be expected).

Family history

Table 3 shows information on MH history of the groups. The No MH Problem group have the lowest rates of family psychiatric history of any kind compared with the other groups. The Other group in turn, have lower rates than the UHR group (odds ratio: 2.36, 95% CI: 1.1–5.1, $p = 0.03$).

Self-harm and/or attempted suicide

The No MH Problem group showed significantly lower rates on all items except self-harm in the last

Table 3. *Family Mental Health History and Clinical Self Report History*

	No MH problems ($N = 59$)	Other ($N = 233$)	UHR ($N = 44$)	FEP ($N = 25$)	NMHP *v.* O	O *v.* UHR	UHR *v.* FEP
	N (%)				*p*		
Family history psychosis	3 (5)	32 (16)	12 (31)	5 (23)	**0.04**	**0.03**	0.50
First degree FH psychosis	3 (5)	20 (10)	7 (18)	3 (14)	0.29	0.14	0.66
First degree FH other	5 (9)	27 (13)	5 (13)	4 (18)	0.35	0.93	0.57
Lifetime self-harm	1 (2)	42 (18)	11 (25)	8 (32)	**0.002**	0.28	0.53
Self-harm in last year	0	12 (5)	4 (9)	4 (16)	0.07	0.30	0.39
Lifetime suicide attempt	1 (2)	67 (29)	17 (39)	15 (60)	**0.000**	0.19	0.09
Suicide attempt in last year	0	24 (10)	8 (18)	7 (28)	**0.01**	0.13	0.34
	Median (Interquartile Range)				*p*		
Anxiety	2 (0–5)	7 (5–9)	8 (7–9)	7 (5–10)	**0.000**	0.16	0.36
Depression	2 (0–7)	7 (5–9)	8 (7–10)	8 (5–10)	**0.000**	**0.02**	0.52
Highest SOFAS	80 (70–80)	70 (60–80)	65 (60–70)	58 (50–71)	**0.004**	**0.01**	0.18
Lowest SOFAS	70 (65–80)	65 (55–75)	55 (50–64)	55 (40–66)	**0.000**	**0.000**	0.74
Drop in points	0 (0–10)	0 (0–10)	9 (0–15)	0 (0–10)	0.56	**0.006**	0.12

Bold values included are significant at $p \leq 0.05$.

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

year compared with the Other group. However, the lack of significance is most likely due to the low numbers as none of the No MH Problem group had self-harmed in the last year and just 12 (5%) of the 233 Other group had engaged in an act of self-harm in the year prior to assessment. The Other, UHR and First Episode Psychosis groups did not differ significantly from each other.

Anxiety and depression

Self-ratings for anxiety and depression can be found in Table 3. The Other group rated themselves as significantly more anxious and depressed than the No MH Problem group. The UHR group had significantly higher ratings for depression but not anxiety, compared with the Other group, while the UHR and First Episode groups had similar ratings for both anxiety and depression.

Social functioning

Clinical ratings of functioning (Table 3) followed a similar pattern, the No MH Problem differing significantly from the Other group, who in turn differed from the UHR group, who did not differ greatly from the First Episode Psychosis group. The UHR group reported the greatest recent drop in functioning of all the groups (as would be expected).

Discussion

This study sought to compare demographic and clinical characteristics of prisoners at UHR of psychosis with those not on the psychotic spectrum as well as a group experiencing their first episode of psychosis. We identified four groups, those experiencing a first episode of psychosis, those at UHR for psychosis, those with other MH problems and those with no MH problems.

Endorsement of PQ-B items at screen and distress was high for all groups except for the No MH problems group. However, the low specificity of the PQ-B in this population as reported in our earlier paper (Jarrett *et al.* 2012) was due to a range of issues which included misinterpretation of items and high levels of anxiety in the early days of reception to prison. Distress can associated with items that are not necessarily related to psychotic spectrum, e.g. Do you worry at times that something may be wrong with your mind?' participants described feeling anxious, out of control in their life, unable to understand why they could not manage their anger, or overcome a substance use problem. Endorsement of this item was therefore frequently associated with distress. These issues were established at the second stage interview with the CAARMS.

Our findings showed a spectrum of symptoms and distress ranging from very low (True Negatives) to very high (Psychotic). The Other and UHR group were in between with the UHR group emerging as having a similar clinical profile to the First Episode Psychosis group. Our study shows that despite the challenges of identifying UHR in this population, it is possible to delineate the UHR group from those with other mental disorders. The high levels of homelessness in the UHR group has important implications since a research suggests that reduced social networks pre-date first episode and may therefore play a role in the evolution of the illness (Gayer-Anderson & Morgan, 2013).

The Other group had a range of MH problems, which were sufficiently serious that they require more than General Practitioner intervention, but not so severe that they would be taken on by the Prison Mental Health Team whose remit is severe and enduring mental illness. This is consistent with previous findings that 50% of MH problems reported by prisoners are not addressed in prison (Byng *et al.* 2012). The Improved Access to Psychological Therapies (IAPT) for Offenders was rolled out in 2009 in recognition of high levels of common mental disorders in prisons (Department of Health, 2009). However, there has been no large-scale evaluation of these services to date.

Previous literature has also already reported on the high rates of self-harm and suicide risk in those at risk for psychosis (Hutton *et al.* 2011; Kelleher *et al.* 2012). This is an important issue for safer custody. An early detection or intervention service has the potential to identify those with associated markers of risk to self, such as those experiencing emerging MH problems. Current reception screening procedures are aimed at identifying those with diagnosis and do not ask about symptoms. Nevertheless, identification of prisoners with severe mental illness remains inadequate with many prisoners with severe MH problems going identified and untreated, while in custody (Senior *et al.* 2013). This study identified 3% ($N = 25$) as first episode psychosis within the first 2 weeks of reception. Although it is possible that some may have made transition within that time, it is also likely that at least some were psychotic prior to reception. The high levels of depression and anxiety have been repeatedly confirmed in studies of UHR patients (Fusar-Poli *et al.* 2012*b*; Rietdijk *et al.* 2013). Arguably, the most consistent clinical factor associated with transition is a decline in functioning (Ruhrmann *et al.* 2010; Velthorst *et al.* 2013), although low baseline functioning scores are also associated with transition outcome (Cannon *et al.* 2008; Valmaggia *et al.* 2013). The

https://doi.org/10.1017/S2045796015000062 Published online by Cambridge University Press

difference in functioning between the UHR and False Positive group may be indicative of important distinguishing factors between those at risk for psychosis and those at risk of other MH disorders.

Strengths and limitations

To the best of our knowledge when we began this study it was the first to examine ARMS in the prison population. All prisoners meeting eligibility criteria were approached for screening. The refusal rate was low as is usual in prison studies (Birmingham *et al.* 1996; Singleton *et al.* 1998). We changed the upper age criteria in the early months of the study from 40 to 35 years but do not believe this had an undue influence on the findings since the group aged 36+ were such a small group.

Owing to the large numbers screened, we were able to identify clear subgroups within the population. Our prevalence rate of 5% UHR of the total population screened suggests that we did not include people who were experiencing symptoms while under the influence of substances. On the contrary, the relatively lower prevalence compared with high psychosis rates of prisoners suggest that we may have been overly conservative in our CAARMS criteria. Those individuals who reported symptoms in very specific contexts (e.g. trauma, only under the influence of particular substances, etc.) were discussed with the community team and when their symptoms could be better explained by another diagnosis or cause, they were not thought to meet criteria for UHR. At times, UHR was ruled out after a later follow-up interview.

Unfortunately, lack of resources meant that we were not able to follow participants up which would have been useful to gauge a rate of transition to psychosis. For the same reason we were unable to include prisoners who did not speak English at a minimum level. For future research it would be useful to examine a breakdown on items on each subscale rather than just the overall scale score. This would inform us if, for example, scoring on non-bizarre ideas was related to just the 'suspiciousness' item. We were also unable to carry out some CAARMS interviews due to participants being transferred or released. Although we had anticipated this at the beginning of the study it proved to be a logistical problem beyond our control. This represents a potential barrier to continuous care in the case of service provision (Black *et al.* 2011). However, we demonstrated that while this population were non-help-seeking, and had various opportunities to opt out of the assessment process, they nevertheless responded to the offer of help. They agreed to take part in the research, they endorsed items on the screening questionnaire, also reported distress on the items when asked, agreed to participate in the second stage assessment and agreed to be triaged to services. This is a strong indication that populations who do not actively help seek in the community are not actively rejecting help or perceiving it to be unnecessary. Whether or not those triaged engage successfully can only be measured by some degree of follow up and this unfortunately was not possible in this study.

The validation of questionnaires for prisoner populations is also important and there is even an argument for developing questionnaires that address the particular issues of individuals in these environments. Much of the research that is carried out in prisons is often with the use of assessment tools validated in community settings and most likely fails to address some of the inherent issues of custodial settings and populations.

The study was carried out in a male adult local prison with men awaiting trial or serving short sentences. The results cannot be generalised to female prisoners or young offenders, or prisoners serving long sentences, or to community populations.

Our findings show that the UHR and First Episode Psychosis groups have very a similar MH profile – one of psychotic like symptoms, mood dysregulation and high levels of distress as measured on the screening questionnaire, low baseline functioning, as well as self-harm and suicide attempts. In contrast the differences to the group with other MH problems were substantial and the profile was starkly different to the True Negative group.

Prisons offer an opportunity for a 'one-stop-shop' approach to physical and mental healthcare and emergent thinking is that this can be best achieved through delivering services that cut through traditional primary and secondary care divisions, along the lines of a poly-clinic model.

Acknowledgements

Our special thanks go to the staff and prisoners of the prison and the staff of OASIS. The work was carried out under the Department of Psychosis, Institute of Psychiatry, King's College London, London, UK.

Financial Support

The project was financially supported by a generous grant from the Guy's and St. Thomas' Charitable Foundation. We acknowledge the NIHR Biomedical Research Centre for Mental Health at the South London and Maudsley NHS Foundation Trust and

the Institute of Psychiatry Kings College London for their financial support.

Conflict of Interest

None.

Ethical Standard

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008.

References

Birmingham L, Mason D, Grubin D (1996). Prevalence of mental disorder in remand prisoners: consecutive case study. *British Medical Journal* **313**, 1521–1524.

Black G, Forrester A, Wilks M, Riaz M, Maguire H, Carlin P (2011). Using initiative to provide clinical intervention groups in prison: a process evaluation. *International Review of Psychiatry* **23**, 70–76.

Brugha T, Singleton N, Meltzer H, Bebbington P, Farrell M, Jenkins R, Coid J, Fryers T, Melzer D, Lewis G (2005). Psychosis in the community and in prisons: a report from the British National Survey of psychiatric morbidity. *American Journal of Psychiatry* **162**, 774–780.

Byng R, Quinn C, Sheaff R, Samele C, Duggan S, Harrison D, Owens C, Smithson P, Wright C, Annison J, Browns C, Taylor R, Henley W, Qureshi A, Shenton D, Porter I, Warrington C, Campbell J (2012). *COCOA: Care for Offenders Continuity of Access*. London National Institute for Health Research, Queen's Printer and Controller of HMSO, London.

Cannon TD, Cadenhead K, Cornblatt B, Woods SW, Addington J, Walker E, Seidman LJ, Perkins D, Tsuang M, McGlashan T, Heinssen R (2008). Prediction of psychosis in youth at high clinical risk: a multisite longitudinal study in North America. *Archives of General Psychiatry* **65**, 28–37.

Department of Health (2002). *Health Promoting Prisons: A Shared Approach*. London: Department of Health.

Fusar-Poli P, Byrne M, Badger S, Valmaggia LR, McGuire PK (2012*a*). Outreach and support in South London (OASIS), 2001–2011: ten years of early diagnosis and treatment for young individuals at high clinical risk for psychosis. *European Psychiatry*. doi:pii: S0924-9338(12) 00098-3. 10.1016/j.eurpsy.2012.08.002 [Epub ahead of print].

Fusar-Poli P, Nelson B, Valmaggia L, Yung A, McGuire P (2012*b*). Comorbid depressive and anxiety disorders in 509 individuals with an at risk mental state: impact on psychopathology and transition to psychosis. *Schizophrenia Bulletin*. First published online November.

Fusar-Poli P, Yung AR, McGorry P, van Os J (2013). Lessons learned from the psychosis high-risk state: towards a general staging model of prodromal intervention. *Psychological Medicine* **18**, 1–8 [Epub ahead of print].

Gayer-Anderson C, Morgan C (2013). Social networks, support and early psychosis: a systematic review. *Epidemiology and Psychiatric Sciences* **22**, 131–146.

Goldman HH, Skodol AE, Lave TR (1992). Revising axis V for DSM-IV: a review of measures of social functioning. *American Journal of Psychiatry* **149**, 1148–1156.

Harty M, Tighe J, Leese M, Parrott J, Thornicroft G (2003). Inverse care for mentally ill prisoners: Unmet needs in forensic mental health services. *The Journal of Forensic Psychiatry and Psychology;* **14**, 600–614.

Hutton P, Bowe S, Parker S, Ford S (2011). Prevalence of suicide risk factors in people at ultra-high risk of developing psychosis: a service audit. *Early Intervention in Psychiatry* **5**, 375–380.

Jarrett M, Craig T, Parrott J, Forrester A, Winton-Brown T, Maguire H, McGuire P, Valmaggia L (2012). Identifying men at ultra high risk of psychosis in a prison population. *Schizophrenia Research* **136**, 1–6.

Kelleher I, Lynch F, Harley M, Molloy C, Roddy S, Fitzpatrick C, Cannon M (2012). Psychotic symptoms in adolescence index risk for suicidal behavior: findings from 2 population-based case–control clinical interview studies. *Archives of General Psychiatry* **69**, 1277–1283.

Lin A, Nelson B, Yung AR (2012). 'At Risk' for psychosis: where are we heading? *Epidemiology and Psychiatric Sciences* **21**, 329–334.

Loewy RL, Pearson R, Vinogradov S, Bearden CE, Cannon TD (2011). Psychosis risk screening with the Prodromal Questionnaire – brief version (PQ-B). *Schizophrenia Research* **129**, 42–46.

McGorry P, Bates T, Birchwood M (2013). Designing Youth Mental health services for the 21st century: examples from Australia, Ireland and the UK. *The British Journal of Psychiatry* **202**, s30–s35.

McKenzie CS, Gekoski WL, Knox VJ (2006). Age, gender, and the underutilization of mental health services: The influence of help-seeking attitudes. *Aging & Mental Health,* **10**, 574–582.

Meltzer H, Gill B, Petticrew M (1995). *OPCS Surveys of Psychiatric Morbidity in Great Britain. Report No 1. The Prevalence of Psychiatric Morbidity among Adults aged 16 ± 64 Living in Private Households in Great Britain*. HMSO: London.

Morgan C, Mallett R, Hutchinson G, Bagalkote H, Morgan K, Fearon P, Dazzan P, Boydell J, McKenzie K, Harrison G, Murray R, Jones P, Craig T, Leff J on behalf of the AESOP Study Group (2005). Pathways to care and ethnicity. Part 2: Source of referral and help-seeking. *British Journal of Psychiatry,* **186**, 290–296.

National Treatment Agency for Substance Misuse (2012). NTA prison drug treatment note for Home Affairs Select Committee 2012 Drug Policy Review.

Rietdijk J, Ising HK, Draght S, Klaassen R, Niem D, Wunderink L, Cuijpers P, Linszen M, van de Graag M (2013). Depression and social anxiety in help-seeking patients with an ultra-high risk for developing psychosis. *Psychiatry Research*. ONLINE, February 2013.

Ruhrmann S, Schultze-Lutter F, Salokangas RK, Heinimaa M, Linszen D, Dingemans P, Birchwood M, Patterson P, Juckel G, Heinz A, Morrison A, Lewis S, von Reventlow HG, Klosterkötter J (2010). Prediction of psychosis in adolescents and young adults at high risk: results from the prospective European prediction of psychosis study. *Archives of General Psychiatry* **67**, 241–251.

Senior J, Birmingham L, Harty MA, Hassan L, Hayes AJ, Kendall K, King C, Lathlean J, Lowthian C, Mills A, Webb R, Thornicroft G, Shaw J (2013). Identification and management of prisoners with severe psychiatric illness by specialist mental health services. *Psychological Medicine* **43**, 1511–1520.

Shaw J, Baker D, Hunt IM, Moloney A, Appleby L (2004). Suicide by prisoners. National clinical survey. *British Journal of Psychiatry*, **184**, 263–267.

Shaw J, Senior J, Thornicroft G, Birmingham L, Kendall K, Brooker C (2009). A national evaluation of prison mental health in-reach services. A Report to the National Institute of Health Research.

Singleton N, Meltzer H, Gatward R, Coid J, Deasy D (1998). Psychiatric morbidity among prisoners. *Office of National Statistics*.

Valmaggia L, Stahl D, Yung A, Nelson B, Fusar-Poli P, McGorry P, McGuire P (2013). Negative psychotic symptoms and impaired role functioning predict transition outcomes in the at risk mental state: a latent class cluster analysis study. *Psychological Medicine* 1–15.

Velthorst E, Nelson B, Wiltink S, de Haan L, Wood SJ, Lin A, Yung AR (2013). Transition to first episode psychosis in ultra high risk populations: does baseline functioning hold the key? *Schizophrenia Research* **143**, 132–137.

Williams K, Papadopoulou V, Booth N (2012*a*). Prisoners' childhood and family backgrounds: results from the Surveying Prisoner Crime Reduction (SPCR) longitudinal cohort study of prisoners. Ministry of Justice Research Series 4/12.

Williams K, Poyser J, Hopkins K (2012*b*). Accommodation, homelessness and reoffending of prisoners: results from the Surveying Prisoner Crime Reduction (SPCR) Survey. *Ministry of Justice Research*.

Yung AR, McGorry PD (1996). The initial prodrome in psychosis: descriptive anaD qualitative aspects. *Australian & New Zealand Journal of Psychiatry* **30**, 587–599.

Yung AR, Yuen HP, McGorry PD, Phillips LJ, Kelly D, Dell'Olio M, Francey SM, Cosgrave EM, Killackey E, Stanford C, Godfrey K, Buckby J (2005). Mapping the onset of psychosis: the Comprehensive Assessment of At-Risk Mental States. *Australian & New Zealand Journal of Psychiatry* **39**, 964–971.