Severe mental illness and substance misuse (dual diagnosis): community health and social care services

Draft Review 1: The epidemiology, and current configuration of health and social care community services, for people in the UK with a severe mental illness who also misuse substances

A systematic review

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GLOSSARY AND ABBREVIATIONS

AESOP study: Aetiology and Ethnicity of Schizophrenia and Other Psychoses (AESOP) epidemiological study (conducted 1997-1999)

APMS 2001: Adult Psychiatric Morbidity Survey (Psychiatric Morbidity among Adults [16-74 years] Living in Private Households in England, Wales, and Scotland [Singleton et al. 2001])

APMS 2007: Adult Psychiatric Morbidity Survey (APMS) conducted in England in 2007. The APMS was designed to be representative of the population living in private households in England

AUDIT: Alcohol Use Disorders Identification Test (Babor et al. 2001). WHO measure of alcohol-use disorders. The AUDIT has ten items constructed across three domains: consumption (items 1 to 3); dependence (items 4 to 6); and problems (items 7 to 10). The AUDIT has a maximum score of 40 with the following categories being defined: 1 to 7, low-risk drinking; 8 to 15, hazardous drinking; 16 to 19, harmful drinking; and 20 or more, possible alcohol dependence.

AUS: Alcohol Use Scale (Drake et al., 1990). The AUS is a 5-point scale based on DSM-III-R criteria for severity of disorder: 1 = abstinence, 2 = use without impairment, 3 = abuse, 4 = dependence and 5 = severe dependence.

CMHT: Community Mental Health Team

COMO study: Comorbidity Dual Diagnosis Study (COMO) RCT

COSMIC study: Comorbidity of Substance Misuse and Mental Illness Collaborative (COSMIC) study

CPA: Care Programme Approach

DIP-DM: Diagnostic Interview for Psychosis-Diagnostic Module

DSM-IV: Diagnostic and Statistical Manual of Mental Disorders, 4th Edition

DUS: Drug Use Scale (Drake et al., 1990). The DUS is a 5-point scale based on DSM-III-R criteria for severity of disorder: 1 = abstinence, 2 = use without impairment, 3 = abuse, 4 = dependence and 5 = severe dependence.

EPSILON study: European Psychiatric Services: Inputs Linked to Outcome Domains and Needs (EPSILON) study

GPRD: General Practice Research Database

ICD-9/10: International Statistical Classification of Diseases and Related Health Problems (ICD)- 9th/10th revision

IGC: Item Group Checklist

Mann-Whitney U test: Nonparametric test that makes no assumptions about the probability distributions of the variables being assessed and tests the null hypothesis that two samples come from the same population against the alternative hypothesis that the two samples come from different populations.

NIFEPS: Northern Ireland First Episode Psychosis Study

OPCRIT: Operational Checklist for Psychiatric Disorders

ONS: Office of National Statistics

PANSS: Positive and Negative Syndrome Scale. The PANSS is a scale that measures the severity of symptoms in people with psychosis. It includes 3 subscales: 1 for positive symptoms, 1 for negative symptoms and 1 for general psychopathology. Scores range from 30 to 210, with higher scores indicating greater severity of symptoms.

PPHS: Personal and Psychiatric History Schedule

PSQ: Psychosis Screening Questionnaire (Bebbington & Nayani, 1994, 1995)

SADQ(-C): Severity of Alcohol Dependence Questionnaire (-Community version) (Stockwell et al. 1979). It is a 20-item questionnaire with a maximum score of 60. Five elements of the alcohol dependence syndrome examined are: Physical withdrawal (items 1 to 4); Affective withdrawal (items 5 to 8); Withdrawal relief drinking items (9 to 12); Alcohol consumption items (13 to 16); Rapidity of reinstatement items (17 to 20). SADQ scores of at least 31 indicate severe alcohol dependence

SANS: Scale for the Assessment of Negative Symptoms is a rating scale to measure negative symptoms of psychosis. It is split into 5 domains, and within each domain separate symptoms are rated from 0 (absent) to 5 (severe). Higher scores indicate greater severity of symptoms.

SAPNS: Scales for the Assessment of Positive and Negative Symptoms are rating scales which measure positive and negative symptoms of psychosis. Higher scores indicated a greater severity of symptoms.

SCID: Structured Clinical Interview for DSM Disorders

SCAN: Schedules for Clinical Assessment in Neuropsychiatry

SDS: Severity of Dependence Scale (Gossop et al. 1995)

SIN study: Schizophrenia in Nottingham (SIN) epidemiological study (conducted 1992-1994)

SMI: Severe mental illness

SURSp: Substance Use Rating Scale, patient version (Duke et al. 1994)

Tetrachoric correlation: Tetrachoric correlation is a special case of the polychoric correlation applicable when both observed variables are dichotomous (polychoric correlation is a technique for estimating the correlation between two theorised normally distributed continuous latent variables, from two observed ordinal variables)

EXECUTIVE SUMMARY

Dual diagnosis refers to people with a severe mental illness (including schizophrenia, schizotypal and delusional disorders, bipolar affective disorder and severe depressive episodes with or without psychotic episodes) combined with misuse of substances (the use of legal or illicit drugs, including alcohol and medicine, in a way that causes mental or physical damage). Recent studies have estimated prevalence rates of 20-37% in secondary mental health services and 6-15% in substance misuse settings (Carrà & Johnson, 2009). However, methodological challenges including differing definitions of dual diagnosis, varying timescales for assessing comorbidity, difficulties with diagnosis including diagnostic overshadowing, and the lack of a good theoretical model of the association between severe mental illness and substance misuse, mean that it is still unclear how many people in the UK have a severe mental illness and comorbid substance misuse problems.

There is a growing awareness that individuals with dual diagnosis experience some of the worst health, wellbeing and social outcomes, and are among the most vulnerable in society. A clear understanding of the scale of the problem, the current service (including variations), and the mechanisms of change, are vital in order to interpret differences in outcomes and costs for alternative current models of service delivery, new models of service delivery and/or aspirational models of service delivery.

The National Collaborating Centre for Mental Health (NCCMH) was commissioned by NICE Centre for Public Health (now the Public Health and Social Care Centre) to conduct 4 evidence reviews to help inform the development of a guideline aimed at optimising service organisation and delivery of community health and social care services for adults and young people with coexisting severe mental illness and substance misuse. This systematic review of the epidemiology and current practice for individuals with dual diagnosis living in the community in the UK is the first of these 4 evidence reviews

This review considered epidemiological data derived from cohort studies, cross-sectional studies, surveys, health needs assessments, and the control arm of randomised clinical trials, and data about current practice from surveys, cross-sectional studies and national/regional/local reports, assessments or evaluations, in order to address the following review questions:

RQ 1.1: What are the health and social care needs of people in the UK with a severe mental illness who also misuse substances?

RQ 1.2: What is the current configuration of health and social care community services and the care pathway through which people in the UK with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up?

This review was conducted in accordance with *Developing NICE Guidelines: The Manual* (NICE, 2014). A systematic search was conducted in 18 electronic databases for RQ 1.1 and 3 databases for RQ 1.2 (for studies published from 2000 onwards) and 31 websites. Given the variability across studies, particularly in service setting and sampling frame, the results were largely summarised narratively in text and tables. In addition, some meta-analyses were possible, allowing a comparison between cases with comorbid severe mental illness and substance misuse and controls with severe mental illness-only to examine differences in the probabilities of health and social care needs associated with dual diagnosis.

Overall, 48 studies met the inclusion criteria; 36 for RQ 1.1 and 12 for RQ 1.2. The studies reporting prevalence data for RQ 1.1 (N=31) were subdivided by service setting and sampling frame: 7 studies reported prevalence data for dual diagnosis obtained using comprehensive catchment area survey sampling frames (as a percentage of the general population in a catchment area [N=2] or of individuals with severe mental illness in a catchment area [N=5]) (3 additional studies also used a comprehensive catchment area survey but did not report prevalence data); 21 studies estimated prevalence rates amongst caseloads of secondary mental health services (an additional study sampled from secondary mental health services but did not report prevalence data); 5 studies reported prevalence data for severe mental illness amongst individuals with substance misuse problems who were in contact with community drug or alcohol addiction services; 3 studies reported prevalence data for dual diagnosis across secondary mental health and substance misuse service settings; 2 studies estimated prevalence and incidence respectively amongst those in contact with primary care. Some studies reported prevalence for multiple settings and are reported in each relevant section.

Of the 36 studies identified for RQ 1.1, 13 studies were rated as high quality (++), 10 studies were rated as moderate quality (+) and the remaining 13 studies were rated as poor quality (-), based on the Newcastle-Ottawa Scale (NOS) for assessing the quality of nonrandomised studies. Of the 12 studies identified for RQ 1.2, 2 studies were rated as high quality (++), 9 studies were rated as moderate quality (+) and 1 study as poor quality (-), based on the NICE-adapted AACODS checklist (checklist 1.5 in the NICE 'Interim methods guide for developing service guidance 2014'). The key findings from these studies are summarised below in Evidence statements.

Review question 1.1: What are the health and social care needs of people in the UK with a severe mental illness who also misuse substances?

Evidence Statement 1.1.1: Prevalence in comprehensive catchment area surveys

There is moderate evidence from 6 case-control studies (4 [++][1,2,5,6] , 1 [+][3] and 1 [−][7]) and 1 cohort study [-][4] about the prevalence of dual diagnosis obtained using a comprehensive catchment area survey sampling frame. The evidence about the rates of dual diagnosis are fairly consistent. Two large case-control studies (1 [++][5] and 1 [+][3]) found a prevalence of dual diagnosis in the general adult UK population of 0.05-0.16%. Another 3 studies (1 [++] case-control[2], 1 [-] case-control[7] and 1 [-] cohort[4]) that restricted their comprehensive catchment area survey to people with severe mental illness found prevalence rates of 1.9-7.0% for current harmful drug use or dependence and 7.0-15.5% for current harmful alcohol use or dependence.

There is strong evidence from 3 case-control studies [++][1,5,6] about differences in the rates of substance misuse problems between groups with severe mental illness and a group with no psychiatric diagnosis, no psychosis or compared to general population controls. Consistently higher rates of drug misuse were observed for children[1] and adults[5,6] with severe mental illness (adjusted OR=2.37, $p<0.05$[1] and OR 2.38 [1.13, 4.98], $p=0.02$[5] for lifetime cannabis use; OR 4.83 [2.50, 9.34], $p<0.00001$[6] for harmful drug use/dependence in past year). However, the evidence for alcohol misuse was more mixed, with 1 study [++][5] in adults finding no significant difference in hazardous alcohol use between psychosis and no psychosis groups, and the other 2 studies (1 [++] in children[1] and 1 [++] in adults[6]) finding greater rates of regular alcohol use or dependence for children with depressive disorder (adjusted OR=1.97, $p<0.05$)[1] or adults with schizophrenia (OR 2.36 [1.60, 3.50], $p<0.0001$)[6].

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. Moreover, the surveys were designed to recruit samples that were representative of the population living in community settings.

[1]Boys et al. 2003 (++)
[2]Cantwell 2003 (++)
[3]Coulthard et al. 2002 (+)
[4]Duke et al. 2001 (-)
[5]Houston et al. 2011 (++)
[6]McCreadie 2002 (++)
[7]Voshaar et al. 2011 (-)

Evidence Statement 1.1.2: Prevalence in secondary mental health care services

There is moderate evidence from 9 cohort studies (4 [++][7,13,14,15], 1 [+][1] and 4 [-][3,9,10,12]) and 7 case-control studies (2 [++][11,16], 2 [+][2,5] and 3 [-][4,6,8]) about the prevalence of dual diagnosis amongst those in contact with secondary mental health services. This evidence was mixed with hugely varying prevalence rates across secondary mental health settings of between 11.7% and 61.2% for substance use/misuse/dependence within the past year. If data are combined across studies the prevalence rate is 34.3%, although given the considerable heterogeneity of studies this estimate should be interpreted with caution. Differences in prevalence estimates could not be accounted for by methodological quality (the lowest and highest estimates both come from high quality studies) or distinction between substance use, misuse or dependence. In addition, the timescale (current versus lifetime) for assessing comorbidity and service setting were controlled for in the comparison. However, a number of other sub-analyses were indicative of differences (although, given the number of dimensions on which studies differ it is very difficult to make sense of these differences):

- Geographical location: Higher prevalence in semi-rural (1 [++][7] and 1 [-][4]) relative to urban (3 [++][7,14,15], 2 [+][1,2] and 2 [-][3,10]) or suburban [++][16] areas with estimates of 59.9% relative to 27.3% and 32.5%
- Method of assessment of substance misuse: Broadly similar rates between consensus method (1 [-][3]) and staff ratings (2 [++][7,14], 2 [+][1,2] and 1 [-][4]) of 15.1% and 21.0% respectively, and then higher but similar estimates between documented diagnosis in case notes (2 [-][9,12]), self-report using formal diagnostic interviews [++][11] and self-report using screening instrument (2 [++][15,16]) of 43.4%, 43.1% and 42.5% respectively.
- Year of data collection: Lower rates for data collected pre-2000 (1 [++][13], 1 [+][1] and 2 [-][3,9]) than data collected post-2000 (3 [++][7,11,15] and 3 [-][8,10,12]) with estimates of 15.6% relative to 44.0%.
- Specific timescale: Lower rates for 6 months (2 [++][7,13] and 2 [+][1,2]) than current (2 [++][14,16] and 4 [-][3,8,9,12]) and 1 year (2 [++][11,15]) with estimates of 18.3% relative to 44.5% and 43.6%.

There is strong evidence from 3 cohort studies [++][7,13,14] and 1 case-control study ([+][5] about differences in the rates of severe mental illness diagnosis between cases with substance misuse problems and controls with no recorded substance misuse problems. However, the evidence is somewhat mixed. A meta-analysis of these 4 studies found no significant association between concurrent substance use/misuse and schizophrenia (OR 0.93 [0.68, 1.27]; p=0.63; I^2=32%). One case-control study [-][6] found no statistically significant difference (p=0.51-0.96) in diagnoses of schizophrenia or bipolar affective disorder between substance misuse groups (alcohol-only, alcohol and cannabis, cannabis-only and stimulants-only). However, 1 study [++][13] found increased probability of a diagnosis of depression for adult mental health service patients with substance

misuse/dependence relative to controls without substance misuse problems (OR 1.88 [1.05, 3.36], p=0.03).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence rates were estimated for individuals in contact with mental health services and, given that patients with a dual diagnosis may be at higher risk of disengagement from services, prevalence rates may be underestimated.

[1]Afuwape et al. 2006 (+)
[2]Commander & Odell 2001 (+)
[3]Donoghue et al. 2011 (-)
[4]Hipwell et al. 2000 (-)
[5]Leeson et al. 2012 (+)
[6]Miles et al. 2003 (-)
[7]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[8]Rao et al. 2007/Trathen et al. 2007 (-)
[9]Rowlands 2001 (-)
[10]Schulte & Holland 2008 (-)
[11]Turkington et al. 2009 (++)
[12]Verdolini et al. 2014 (-)
[13]Virgo et al. 2001 (++)
[14]Weaver et al. 2001a and Weaver et al. 2001b (duplicate data) (++)
[15]Weaver et al. 2003/2004 (++)
[16]Wright et al. 2000/2002 (++)

Evidence Statement 1.1.3: Prevalence in substance misuse services

There is moderate evidence from 4 cohort studies (3 [++][3-5] and 1 [-][1]) and 1 case-control study [-][2] about the prevalence of dual diagnosis amongst those in contact with substance misuse services. This evidence is mixed with estimates ranging from 5.7% to 38.8% for the prevalence of severe mental illness amongst individuals with substance misuse problems who are in contact with community drug or alcohol addiction services. If data are combined across studies the prevalence rate is 45.8%, although given the considerable heterogeneity of studies this estimate should be interpreted with caution. Differences in prevalence estimates could not be accounted for by method of assessment of severe mental illness (3 [++][3-5] and 1 [-][1]). Other sub-analyses were indicative of some differences as follows (however, the small number of studies included in these sub-analyses mean that differences might be accounted for by peculiarities of individual studies):

- Geographical location: Higher prevalence in semi-rural or suburban settings (2[-][1,2]) than in urban locations (2 [++][4,5]) with estimates of 60.5% and 20.0% respectively.
- Year of data collection: Higher prevalence post-2000 (1 [++][5] and 1 [-][2]) than pre-2000 [++][3] with estimates of 58.2% and 12.1% respectively.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence rates were estimated for individuals in contact with drug or alcohol addiction services and, given that patients with a dual diagnosis may be at higher risk of disengagement from services, prevalence rates may be underestimated.

[1]Manning et al. 2002 (-)
[2]Rao et al. 2007/Trathen et al. 2007 (-)
[3]Virgo et al. 2001 (++)
[4]Weaver et al. 2001b (++)
[5]Weaver et al. 2003/2004 (++)

Evidence Statement 1.1.4: Prevalence and incidence in primary care

There is moderate evidence from 1 cohort [+][1] study that estimates prevalence of dual diagnosis as 0.02% amongst individuals in contact with primary care.

There is strong evidence from 1 case-control [++][2] study for no difference in the incidence of a diagnosis of psychosis in cases with a drug misuse/dependence diagnosis compared to controls with no drug misuse/dependence history (OR 13.13 [0.74, 233.65]; p=0.08).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence estimates depend on recorded diagnosis by general practitioners and so may underestimate comorbidity in the community as it is tacit knowledge from the field that much substance misuse is not brought to the attention of GPs (tends to be limited to more severe problems and substance dependence) and much mental illness goes undetected by the healthcare services.

[1]Frisher & Akram 2001/Frisher et al. 2004/2005a (+)
[2]Frisher et al. 2013 (++)

Evidence Statement 1.1.5: Characteristics of the dual diagnosis population

There is moderate to strong evidence from 11 cohort studies and 7 case-control studies on the characteristics of the dual diagnosis population.

Severe mental illness

There is moderate evidence from 3 case-control (2 [+][3,8] and 1 [-][9]) and 3 cohort (1 [++][15], 1 [+][1] and 1 [-][11]) studies about the proportion of the dual diagnosis population in secondary mental health services with different severe mental illness diagnoses. The evidence is mixed as regards to the point estimates, however, the pattern is consistent across studies. The severe mental illness most commonly reported as comorbid with substance misuse was schizophrenia, with estimates ranging from 35.9% to 92.3% of the dual diagnosis participants[1,8,9,11,15], followed by bipolar disorder which was the diagnosis made in 10.3% to 13% of dual diagnosis cases[1,10,16]. Substance-induced psychosis was also reported with estimates of 37.5%[3] and 48.7%[11], however, this was an exclusion criteria in some studies.

There is strong evidence from 1 cohort [++][17] study about the proportion of the dual diagnosis population in substance misuse services with different severe mental illness diagnoses. The severe mental illness most commonly comorbid with substance misuse amongst adults in contact with addiction services was severe depression with an estimate of 73.1% relative to schizophrenia and bipolar disorder which were the diagnoses in 7.4% and 3.7% of dual diagnosis cases respectively[18].

Substance misused

There is moderate evidence from 11 cohort (4 [++][10,15,16,17], 3 [+][1,2,6] and 4 [-][4,11,12,14]) and 2 case-control (1 [+][3] and 1 [-][9]) studies about the proportion of the dual diagnosis population in secondary mental health and substance misuse services misusing different substances. The evidence is mixed as regards to the point estimates, however, the pattern is consistent across studies and services. The most commonly reported substances that were misused by people with severe mental illness and substance misuse problems were alcohol and cannabis, with 50.6-84.6% and 29.0-78.5% of the dual diagnosis populations misusing alcohol and cannabis respectively[1-4,6,10,12,13,15-18]. The percentage of the dual diagnosis samples reporting problems with other substances were: 9.7-23.8% for cocaine or crack[1,6,10,17], 6.0-20.8% for stimulants[3,10]; 10.5-12% for amphetamines[6,15]; 0.9-10% for opiates[3,6,10,15].

Age variation

There is moderate evidence from 3 case-control studies (1 [++][5], 1 [+][8] and 1[-][7]) that dual diagnosis is associated with younger age (relative to severe mental illness-only). A meta-analysis of 2 studies (1 [++][5] and 1 [+][8]) found a significantly

younger age of onset of first psychotic symptoms (MD -3.97 [-6.03, -1.91]; p=0.0002; I^2=0%), and a meta-analysis of 2 studies (1 [++][5] and 1[-][7]) found a significantly younger age at first contact with mental health services (MD -3.60 [-5.95, -1.26]; p=0.003; I^2=0%), amongst cases with dual diagnosis relative to severe mental illness-only controls.

Gender variation

There is strong evidence from 4 case-control (3 [++][5,13,18] and 1 [+][8]) and 2 cohort (2 [++][15,16]) studies for a preponderance of males in a dual diagnosis group relative to a group with severe mental illness-only. A meta-analysis of these 6 studies found evidence for a lower proportion of females in the group with comorbid severe mental illness and substance misuse (OR 0.40 [0.32, 0.51], p<0.00001; I^2=0%).

Ethnic variation

There is strong evidence from 2 case-control (2 [++][5,18]) and 2 cohort (1 [++][16] and 1 [+][1]) studies about ethnic variation in rates of dual diagnosis or between cases with severe mental illness and comorbid substance misuse and controls with severe mental illness and no recorded substance misuse. However, the evidence about the direction of this variation is mixed. One study [+][1] found a lower prevalence of dual diagnosis (OR 0.71 [0.53, 0.95]; p=0.02) and a lower rate of cannabis abuse (OR 0.17 [0.09, 0.31]; p<0.00001) in white relative to black dual diagnosis participants, and the reverse pattern for alcohol with higher rates of alcohol abuse (OR 4.91 [2.56, 9.44]; p<0.00001), higher mean monthly consumption of alcohol in units (MD 165.69 [57.92, 273.47], p=0.003) and a higher mean score on the AUDIT (MD 6.97 [3.98, 9.95], p<0.00001) in the white group. However, another study [++][5] found evidence for a contradictory pattern for cannabis use, with a higher number of white participants observed in the group with schizophrenia and lifetime cannabis use relative to those with schizophrenia and no record of cannabis use (OR 2.36 [1.16, 4.78], p=0.02). Finally, a meta-analysis with 2 studies [++][16,18] compared the number of white participants in dual diagnosis relative to severe mental illness-only groups and found no evidence for any statistically significant ethnic variation (OR 1.23 [0.90,1.68]; p=0.19; I^2=0%).

With the exception of age, gender and ethnicity, no evidence was found from English-language studies published from 2000 for any variation in other groups which were identified as being of interest, for example: people with a learning disability; teenage parents; travellers; asylum seekers or refugees; lesbian, gay, bisexual, transsexual or transgender people; sex workers.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]Afuwape et al. 2006 (+)
[2]Barnett et al. 2007 (+)

[3]Commander & Odell 2001 (+)
[4]Donoghue et al. 2011 (-)
[5]Donoghue et al. 2014 (++)
[6]Graham et al. 2001/ Graham & Maslin 2002 (+)
[7]Hipwell et al. 2000 (-)
[8]Leeson et al. 2012 (+)
[9]Miles et al. 2003 (-)
[10]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[11]Rowlands 2001 (-)
[12]Schulte & Holland 2008 (-)
[13]Turkington et al. 2009 (++)
[14]Verdolini et al. 2014 (-)
[15]Virgo et al. 2001 (++)
[16]Weaver et al. 2001a and Weaver et al. 2001b (duplicate data) (++)
[17]Weaver et al. 2003/2004 (++)
[18]Wright et al. 2000/2002 (++)

Evidence statement 1.1.6: Relationship between severe mental illness and substance misuse

There is weak evidence from 3 cohort studies on the relationship between severe mental illness and substance misuse.

There is weak evidence from 1 cohort study [+][1] of a small, non significant correlation between psychotic disorder and alcohol dependence (tetrachoric correlation=0.25) and between psychotic disorder and drug dependence, which showed a trend for significance (tetrachoric correlation=0.4), in a large comprehensive catchment area.

There is weak evidence from 1 cohort study [+][3] that harmful drinking and dependence on cannabis may increase the risk of incident psychotic symptoms at follow-up (OR 3.31 [1.52, 7.22] and OR 3.40 [1.50, 7.73] respectively).

There is weak evidence from 1 cohort study [-][2] suggesting that cannabis use is associated with subsequent increases in manic symptoms (β = 0.20 [0.05, 0.34]; p = 0.009) and depressive symptoms (β = 0.17 [0.04, 0.29]; p = 0.008) in people with bipolar disorder who also use cannabis. Conversely, this study also suggested that higher levels of positive affect increase the odds of cannabis use (OR: 1.25 [1.06, 1.47]; p = 0.008) and that cannabis use is associated with subsequent increases in positive affect (β = 0.35 [0.20, 0.51]; p = 0.000).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]McManus et al. (2009) (+)
[2]Tyler et al. (2015) (-)
[3]Wiles et al. (2006) (+)

Evidence Statement 1.1.7: Prevalence of health and social care needs in dual diagnosis

There is moderate evidence from 2 cohort studies on the prevalence of health and social care needs of people with a dual diagnosis.

There is moderate evidence from 1 cohort study [++][1] suggesting that people with schizophrenia and substance use have a significantly higher level of met and unmet needs than people with schizophrenia only (mean 6.3 [sd=4.4; N=64] versus 4.2 [sd=3.4; N=252]; MD 2.10 [0.94, 3.26], p=0.0004).

There is moderate evidence from 1 cohort study [++][2] suggesting that people from a drug and alcohol service who also had a psychotic disorder have a higher number of needs (range 0-20; mean 7.3 [sd=3.5; N=29] versus 2.2 [sd=1.4; N=64]; MD 5.10 [3.78, 6.42]; p<0.000001), a higher severity of needs (range 0-40; mean 10.7 [sd=6; N=29] versus 2.9 [sd=2.2; N=64; MD 7.80 [5.55, 10.05]; p<0.00001), a higher number of unmet needs (range 0-20; mean 3.7 [sd=2.3; N=29] versus 1 [sd=1.2; N=64]; MD 2.70 [1.81, 3.59]; p<0.00001), but also a higher number of met needs (range 0-20; mean 4.2 [sd=3; N=29] versus 1.5 [sd=1.2; N=64; MD 2.70 [1.57, 3.83], p<0.00001), than people from the same drug and alcohol service who did not have a psychotic disorder.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]Cantwell 2003 (++)
[2]Weaver et al. 2003/2004 (++)

Evidence Statement 1.1.8: Prevalence of health care needs in dual diagnosis

There is moderate to strong evidence from 4 cohort studies and 5 case-control studies on the health care needs of people with a dual diagnosis. The evidence was generally consistent with moderate heterogeneity found in one outcome for symptom duration and severity.

Symptom duration and severity

There is strong evidence from 3 case-control studies (2[++][2,6] and 1[+][4]) about differences in the duration of the severe mental illness. No difference was found in between people with a dual diagnosis and those with schizophrenia only for the duration of untreated psychosis when measured dichotomously (29/53 versus 28/50; OR 0.95 [0.44, 2.07]; p=0.90)[6] or continuously (MD -10.47 [-42.71, -21.77], p=0.52)[4]. There was also no difference in the number of days from the onset of psychosis to first contact with mental health services for psychosis (median 86 days [IQR=31-238; N=85] versus 138 days [IQR=29-546; N=58]; U and p NR)[2] between those with schizophrenia and cannabis use compared with those with schizophrenia only.

There is strong evidence from 3 case-control studies (2 [++][1,6] and 1 [+][4]) and 1 cohort study [++][7] about differences in psychiatric symptom severity between people with a dual diagnosis and those with severe mental illness only. A meta-analysis of 2 studies[6,7] found a higher rate of relapse or non-remission amongst a dual diagnosis group (OR 2.86 [1.90, 4.31], p<0.00001; I^2=0%). In addition, a meta-analysis of 3 studies[1,4,6] found greater severity of positive symptoms in the dual diagnosis group (SMD 0.20 [0.02, 0.38]; p=0.03; I^2=0%). Moreover, these differences appear to be specific, as no evidence was found for a difference in negative symptoms[1,4,6] (SMD -0.01 [-0.29, 0.26]; p=0.93; I^2=55%) or symptoms of depression[4] (SMD -0.15 [-0.56, 0.27]; p=0.49) between people with a dual diagnosis and those with severe mental illness and no reported substance misuse problems.

Suicide

There is strong evidence from 1 cohort study [++][5] that there is no difference in the rates of attempted suicide in dual diagnosis relative to severe mental illness-only groups (OR 1.73 [0.86, 3.46], p=0.12 for alcohol abuse/dependence; OR 1.07 [0.51, 2.23], p=0.86 for drug abuse/dependence).

Medication adherence

There is strong evidence from 2 case-control studies (1 [++][6] and 1 [+][4]) and 1 cohort study [++][8] about differences in medication compliance between people with a dual diagnosis and those with severe mental illness-only. All 3 individual studies found significantly greater medication non-adherence associated with comorbid substance misuse in individuals with severe mental illness (p values:

<0.00001 – 0.02).

Met and unmet needs

There is strong evidence from 1 cohort study [++][9] about differences in met and unmet treatment needs between individuals with severe mental illness with or without coexisting substance misuse. This study compared self-reported levels of need between CMHT clients with substance misuse and CMHT clients without substance misuse, and between drug and alcohol service patients with a co-existing psychotic disorder and drug and alcohol service patients with no co-existing psychiatric disorder, and found higher levels of need in the dual diagnosis groups across all Camberwell Assessment of Need (CAN)-derived measures encompassing both met and unmet needs (p values: <0.00001 – 0.03).

Service utilisation

There is moderate evidence from 1 case-control study [-][3] and 1 cohort study [++][5] about differences in service utilisation between dual diagnosis and severe mental illness-only groups. A meta-analysis of these 2 studies found a greater number of participants with a dual diagnosis had been admitted as an inpatient over the past 1-2 years compared with those with a severe mental illness only (OR 2.78 [1.61, 4.81], p=0.0002; I^2=0%).

Physical health care needs

No evidence was found from English-language studies published from 2000 for other health care needs that were identified as being of interest in a dual diagnosis population, for example, the prevalence of coexisting physical health problems.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, the majority of the data were obtained from individuals in contact with secondary mental health services and it is likely that the health care needs of this group will be a conservative estimate of the needs in the wider undetected or disengaged dual diagnosis population.

[1]Cantwell 2003 (++)
[2]Donoghue et al. 2014 (++)
[3]Hipwell et al. 2000 (-)
[4]Leeson et al. 2012 (+)
[5]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[6]Turkington et al. 2009 (++)
[7]Virgo et al. 2001 (++)
[8]Weaver et al. 2001a (++)
[9]Weaver et al. 2003/2004 (++)

Evidence Statement 1.1.9: Prevalence of social care needs in dual diagnosis

There is moderate to strong evidence from 4 cohort studies and 6 case-control studies on the social care needs of people with a dual diagnosis. There was some inconsistent evidence for education and social functioning outcomes. Evidence for other outcomes was generally consistent.

Education

There is moderate evidence from 2 case-control studies (1[+][5] and 1 [-][4]) and 1 cohort study [++][3] that there are no differences in education between dual diagnosis and severe mental illness-only groups. A meta-analysis of 2 studies (1 [++][3] and 1 [-][4]) found no difference in the number of participants leaving school by age 16 or with no qualifications between those with severe mental illness and coexisting substance misuse and those with severe mental illness-only (OR 1.71 [0.41, 7.06]; p=0.46; I^2=62%). Another study [+][5] also found no difference in mean years of education between cases with schizophrenia and lifetime cannabis use and controls with schizophrenia who had never used cannabis (MD -0.33 [-1.15, 0.49]; p=0.43).

Employment

There is strong evidence from 3 cohort studies (3 [++][3,6,8]) for differences in unemployment rates between a dual diagnosis group and a severe mental illness-only group. A meta-analysis of these 3 studies found a greater number of people who were unemployed in the dual diagnosis group (OR 1.93 [1.35, 2.77], p=0.0003).

Housing

There is strong evidence from 3 case-control studies (2 [++][1,10] and 1 [-][4]) and 1 cohort study [++][6] for differences in housing between those with severe mental illness with and without comorbid substance misuse. A meta-analysis of 3 studies (2 [++][6,10] and 1 [-][4]) found an increased probability of a history of homelessness or housing problems amongst the dual diagnosis group (OR 6.43 [2.60, 15.93], p<0.0001; I^2=19%). Another study [++][1] found an increased probability of living in the most deprived areas for a dual diagnosis group relative to a severe mental-illness only control (OR 2.31 [1.25, 4.27]; p=0.008).

Violence and contact with the criminal justice system

There is moderate evidence from 3 case-control studies (1 [++][10], 1 [+][2] and 1[-][7]) and 1 cohort study [++][6] about differential rates of violence in dual diagnosis groups. The evidence shows inconsistent results when comparing the effects of comorbid substance misuse (among those with severe mental illness) relative to the effects of comorbid severe mental illness (among those with substance misuse). A meta-analysis of 3 studies (2 [++][6,10] and 1 [+][2]) found an increased

probability of a recent history of violent behaviour for those with dual diagnosis relative to those with severe mental illness-only (OR 2.81 [1.84, 4.28]; p<0.00001; I^2=0%). Another study [-][7] also suggested a higher probability of violence in those with severe mental illness and co-existing substance misuse relative to those with severe mental illness only as a higher prevalence of dual diagnosis was found in patients attending a CMHT with a history of violence relative to a comparable group with no history of violence (OR 4.10 [2.61, 6.44]; p<0.00001). Conversely, a study [+][2] that compared self-reported violent behaviour in the last 5 years between cases with substance misuse and severe mental illness relative to controls with substance misuse-only found no difference between the groups (OR 0.85 [0.21, 3.48]; p=0.83).

There is strong evidence from 3 case-control studies (2 [++][1,10] and 1 [-][4]) and 1 cohort study [++][6] about differential contact with the criminal justice system amongst those with dual diagnosis. A meta-analysis of these 4 studies found an increased probability of a recent history of contact with the criminal justice system in a group with severe mental illness and co-existing substance misuse relative to a group with severe mental illness only (OR 4.38 [2.90, 6.61], p<0.00001; I^2=13%). One of these studies [-][4] also found that participants with a dual diagnosis were more likely to have been the victim of a crime (OR 9.00 [1.52, 53.40]; p=0.02).

Social functioning

There is strong evidence from 2 case-control studies (1 [++][1] and 1 [+][5]) and 1 cohort study [++][9] about the effects of substance misuse on social functioning amongst those with severe mental illness. However, evidence was mixed. A meta-analysis of 2 studies (1 [++][1] and 1 [+][5]) found no difference in social functioning between a group with dual diagnosis and a group with severe mental illness only (SMD 0.18 [-0.45, 0.80]; p=0.58; I^2=84%). Conversely, another study [++][9] compared social functioning between CMHT clients with substance misuse and CMHT clients without substance misuse and found poorer social function in the dual diagnosis group (U = 6971.0, p=0.002).

No evidence was found from English-language studies published from 2000 for other social care needs that were identified as being of interest in a dual diagnosis population, for example, social isolation, low income, history of being 'looked after' or adopted or domestic violence and abuse.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, the majority of the data were obtained from individuals in contact with secondary mental health services and it is likely that the social care needs of this group will be a conservative estimate of the needs in the wider undetected or disengaged dual diagnosis population.

[1]Cantwell 2003 (++)
[2]Coid et al. 2006a (+)
[3]Donoghue et al. 2014 (++)

[4]Hipwell et al. 2000 (-)
[5]Leeson et al. 2012 (+)
[6]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[7]Rao et al. 2007/Trathen et al. 2007 (-)
[8]Virgo et al. 2001 (++)
[9]Weaver et al. 2003/2004 (++)
[10]Wright et al. 2000/2002 (++)

Review question 1.2: What is the current configuration of health and social care community services and the care pathway through which people in the UK with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up?

Evidence Statement 1.2.1: Current configuration of health and social care community services for people with dual diagnosis

There is moderate evidence from 12 studies of national, regional or local reports, assessments or evaluations (2 [++][3,12], 9[+][1,2,4-6,8-11] and 1[-][7]) describing current service delivery structures of community services for people with dual diagnosis in the UK. Twelve adult services were described within 6 studies (1 [++][12], 4 [+][2,4,9,11] and 1 [-][7]). Fourteen adolescent services were described in 1 study [+][8]. Twelve education and training services were described in 5 studies (2 [++][3,12] and 3 [+][1,5,6]). Overall the evidence highlights great inconsistencies in the configuration of dual diagnosis services within NHS trusts across the UK. These inconsistencies lie in a number of areas including sources of funding, structure of services, type of staff members, services delivered and coordination of care. Despite the variability in findings, the services can be divided into 5 broad categories:

(a) separate dual diagnosis services which accept referrals and provide interventions
(b) integrated services run by staff members from mental health and substance misuse services who accept referrals and provide interventions
(c) integrated teams who provide support and advice to existing mental health and substance misuse services acting as consultants and ensuring adequate service provision for dual diagnosis service users
(d) groups providing opportunities for networking
(e) educational courses and skills training.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, as a large number of these services are no longer running, the current configuration of community services remains unclear.

[1]Bailey 2002 (+)
[2]Bayney et al. 2002 (+)
[3]Bell 2014 (++)
[4]Dugmore 2011 (+)
[5]Gorry & Dodd 2008 (+)
[6]Manley et al. 2008 (+)
[7]Mental Health Network 2009 (-)
[8]National Treatment Agency for Drug Misuse 2007 (+)
[9]Sims et al. 2003 (+)
[10]Swinden & Barret 2008 (+)

[11]Trippier & Parker 2008 (+)
[12]Turning Point 2007 (++)

INTRODUCTION

The National Institute for Health and Care Excellence (NICE) has been asked by the Department of Health to develop a guideline on effective multi-agency working to improve access to community health and social care services for people with severe mental illness and substance misuse. This review is the first of 4 reviews to inform the guideline.

- Review 1 considers the epidemiology and current configuration of health and social care community services for people in the UK, with a severe mental illness who also misuse substances.
- Review 2 will consider the service users, their family or carers, provider and commissioner views and experiences of health and social care community services for people with a severe mental illness who also misuse substances
- Review 3 will consider the effectiveness and efficiency of service delivery models
- Review 4 will consider the cost-effectiveness of service delivery models.

1.1 CONTEXT IN WHICH THE REVIEW IS SET

A systematic review (Carrá & Johnson, 2009) examining prevalence rates of psychosis and comorbid substance use in the UK found that recent studies estimate rates of 20-37% in mental health settings, and 6-15% in addiction settings. However, reviewing the literature on dual diagnosis presents significant challenges, and thus it is unclear how many people in the UK have a severe mental illness and misuse substances. The first of these challenges concerns the definition of dual diagnosis, the term is used to refer to a wide spectrum of co-occurring psychiatric disorders and substance misuse. In terms of the psychiatric disorder component, definitions include any mental health problem, severe mental illness (which sometimes includes personality disorders and/or severe depression), psychosis broadly defined (including bipolar disorder) and schizophrenia. While, the definition of substance misuse is no less problematic and has included inconsistent definitions, for example, diagnostic classifications of substance misuse (DSM-IV and ICD-10) and operational definitions (generally scores above threshold on standardized measures of alcohol and drug misuse). Moreover, there is an important distinction between substance abuse or dependence and use of substances including non-harmful or non-dependent use, however, both have been included under the 'dual diagnosis' term[1]. In addition, differences in the timescales for assessing comorbidity (for example, lifetime, 1 year, 6 months, current) have further complicated the issue. There may

[1] It is worth noting that for the purpose of this guideline, dual diagnosis is defined as a severe mental illness combined with misuse of substances. Severe mental illness in this guideline includes a clinical diagnosis of: schizophrenia, schizotypal and delusional disorders; bipolar affective disorder; severe depressive episode(s) with or without psychotic episodes. Substance misuse refers to the use of legal or illicit drugs, including alcohol and medicine, in a way that causes mental or physical damage. This may include low levels of substance use that would not usually be considered harmful or problematic, but may have a significant effect on the mental health of people with a mental illness such as psychosis.

also be practical problems with diagnosis, including diagnostic overshadowing (for example, substance misuse may mask an underlying severe mental illness or vice versa). Obtaining a comprehensive understanding of the epidemiology and current practice is also complicated by the lack of a good theoretical model of the association between severe mental illness and substance misuse, and the fact that the disorders individually are treated in completely different ways (Tyrer & Weaver 2004).

Although there is continued uncertainty about the exact scale of the problem, there is a growing awareness that adults and young people who have a severe mental illness and misuse substances are among the most vulnerable in society and experience some of the worst health, wellbeing and social outcomes (Crome et al. 2009). The review of qualitative evidence for the NICE clinical guideline *Psychosis with Coexisting Substance Misuse* (CG120), found that having a dual diagnosis in itself can affect a person's ability to access and engage in services and treatment. In addition, stigma, ethnicity, and gender may also act as barriers to accessing services. Once a person had accessed services, it was also a common experience for 1 of the problems to be treated but not the other. Different treatment philosophies can make it difficult for people to receive coherent and effective treatment: some mental health services are proactive in engaging and retaining vulnerable people with psychosis in treatment (such as assertive outreach teams), however, if a service does not view the treatment of substance misuse as an integral part of mental health treatment, this aspect of the person's needs is likely to be overlooked. In addition, most substance misuse services usually expect some level of readiness to change and the service user to attend a clinic for treatment, which may not be immediately possible for some people with severe mental illness, dependence and complex social problems, and for people who do not see their substance misuse as problematic.

Consensus agreements have been reached on key elements of treatment approaches, most notably, the Department of Health (2002) *Dual Diagnosis Good Practice Guide* identified the integrated model of care, based on a delivery system pioneered in the US, as the preferred method. This guide advocated "mainstreaming" so that mental health services should deliver care for both the mental health problem and the substance misuse problem, with substance misuse services providing support, advice and joint working, based on the rationale that substance misuse is usual rather than exceptional amongst people with severe mental illness.

In the UK, service configurations, treatment philosophies and funding streams mitigate against integrated provision. Mental health and substance misuse services are separate, often provided by different organisations, and even when both are provided by the same NHS trust they usually have different organisational and managerial structures, and staff within each service often lack the knowledge and skills for working with people from the 'other' group.

In order to adequately understand service needs or the effectiveness of various service interventions, it is first necessary to explore the underlying health and /or

service concerns first. However, epidemiological systematic reviews are lacking in this area. Providing guidance on effective multi-agency working to improve access to services for people with a dual diagnosis requires a theoretical understanding of the mechanisms of change and this may be difficult to extract from published papers.

1.2 AIMS AND OBJECTIVES OF THE REVIEW

- To review the health and social care needs of people in the UK with a severe mental illness who also misuse substances
- To review the current configuration of health and social care community services in the UK and describe the care pathway through which people with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up

1.3 REVIEW QUESTIONS AND PROTOCOL

The review protocol summary, including the review question and the eligibility criteria used for this review, can be found in Table 1. The full protocol is available at here.

Table 1: Review protocol summary for evidence review 1 (the epidemiology, and current configuration of health and social care community services, for people in the UK with a severe mental illness who also misuse substances)

Component	Description
Review question(s)	RQ 1.1: What are the health and social care needs of people in the UK with a severe mental illness who also misuse substances? RQ 1.2: What is the current configuration of health and social care community services and the care pathway through which people in the UK with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up?
Condition or domain being studied	'Dual diagnosis' was defined as a severe mental illness combined with misuse of substances. Severe mental illness includes a clinical diagnosis of: • schizophrenia, schizotypal and delusional disorders • bipolar affective disorder • severe depressive episode(s) with or without psychotic episodes Substance misuse refers to the use of legal or illicit drugs including alcohol and medicine, in a way that causes mental or physical damage (this may include low levels of substance use that would not usually be considered harmful or problematic, but may have a significant effect on the mental health of people with a mental illness such as psychosis)
Context	Included: Community settings (including a range of services provided by the NHS, social care and schools, as well as the community and voluntary sectors) in the UK

Component	Description
	Excluded: • non-UK studies • prisons and other custodial settings • young offenders units • forensic secure mental health settings
Population	Included: Young people (aged 14 to 25) and adults (over 25) who have been diagnosed as having a severe mental illness and who misuse substances (dual diagnosis) who live in the community. Excluded: • children (aged under 14 years old) • people with a severe mental illness but no evidence of substance misuse (apart from as a control group) • people who misuse substances who have not been diagnosed with a severe mental illness (apart from as a control group) • people with a severe mental illness who smoke or use tobacco but do not misuse any other substances • people who have a severe mental illness and misuse substances, but who are not living in the community
Intervention(s), exposure(s)	People who have been diagnosed as having a severe mental illness and who misuse substances
Comparator(s)/ control	• general UK population • people with a severe mental illness who do not misuse substances • people who misuse substances but do not have a coexisting severe mental illness
Primary/critical outcomes	• Prevalence and incidence of combined severe mental illness and substance misuse (dual diagnosis) • Prevalence and incidence of dual diagnosis by: mental health diagnosis; substance that is misused; setting; sociodemographic characteristics (for instance, gender, age); geographical region • Prevalence of other coexisting conditions, for instance, physical health problems • Prevalence of social care needs (such as housing, employment rate, financial issues, legal issues)
Study design	Included: Cohort studies, cross-sectional studies, surveys, health needs assessments. Epidemiological data derived from the control arm of randomised clinical trials and case-control studies will be considered if there is evidence of reasonable representativeness of the sample.

1.4 IDENTIFICATION OF POSSIBLE EQUALITY AND EQUITY ISSUES

The following equality issues were identified through scoping and the NICE equality impact assessment[2] and where possible, consideration was given to the specific needs of:-

- older people
- people with a learning disability
- teenage parents
- people from black and minority ethnic groups
- travellers
- asylum seekers or refugees
- women
- lesbian, gay, bisexual, transsexual or transgender people
- people who are homeless or in insecure accommodation
- people from a low-income family or on a low income
- people who are socially isolated
- ex-offenders
- sex workers
- people who are, or have a history of being, 'looked after' or adopted
- adults who have a history of experiencing, or witnessing or perpetrating violence or abuse
- young people who have experienced abuse or witnessed domestic violence and abuse
- young people who are excluded from school
- young people whose parents have mental health or substance misuse problems

[2] Available at: http://www.nice.org.uk/guidance/gid-phg87/documents/severe-mental-illness-and-substance-misuse-dual-diagnosis-community-health-and-social-care-services-equality-impact-assessment-scoping2

METHODOLOGY

1.5 LITERATURE SEARCH AND ABSTRACT APPRAISAL

Based on the scope, a systematic search strategy was developed to identify relevant evidence published from 2000 to March 2015. The balance between sensitivity (the power to identify all studies on a particular topic) and specificity (the ability to exclude irrelevant studies from the results) was carefully considered, and a decision made to utilise a systematic and exhaustive approach to the searches to maximise the retrieval of evidence. Searches were conducted in the following databases:

- Applied Social Sciences Index and Abstracts (ASSIA)
- CINAHL
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Database of Reviews of Effect (DARE)
- Cochrane Database of Systematic Reviews (CDSR)
- Econlit
- Embase
- EPPI Centre databases - Bibliomap and DOPHer
- HMIC
- IBSS
- MEDLINE and MEDLINE in Process
- PsycEXTRA
- PsycINFO
- Social Care Online
- Social Policy & Practice
- Social Science Citation Index
- Social Service Abstracts
- Sociological Abstracts

All databases were searched for RQ 1.1. Searches for RQ 1.2 were restricted to management, policy and practice databases (EconLit, HMIC and SPP), in order to allow significantly more time to search web pages, the most likely avenue for identification of the study types in question.

The search strategies were initially developed for MEDLINE before being translated for use in other databases/interfaces. Strategies were built up through a number of test searches and discussions of the results of the searches with the project team to ensure that all relevant search terms were covered. In order to assure comprehensive coverage, search terms for dual diagnosis were kept purposefully broad to help counter dissimilarities in database indexing practices and thesaurus terms, and imprecise reporting of study populations by authors in the titles and abstracts of records. The search terms for the MEDLINE search are set out in full in Appendix 1.

Search restrictions included the following:

- Date (publication limit 2000-current)
- Language (English-language studies) limits
- Animal studies, letters, editorials and other non-relevant publication types
- Searching Embase using only major Emtree headings
- Epidemiology filter (developed in-house)

The following websites were also searched:

- Agency for Healthcare Research and Quality
- Care Quality Commission
- Centre for Mental Health
- Department of Health
- DrugScope
- European Monitoring Centre for Drug & Drug addiction
- Faculty for Public Health
- Google UK (for identification of evidence in other relevant websites)
- Health and Social Care Information Centre
- Healthcare Quality Improvement Partnership
- Healthcare Improvement Scotland
- Health in Wales
- Institute for Public Policy Research
- Joseph Rowntree Foundation
- Kings Fund
- National Audit Office
- National Survivor User Network
- NHS Improving Quality
- Office for National Statistics
- Royal College of General Practitioners
- Royal College of Nursing
- Royal College of Physicians
- Royal College of Psychiatrists
- Rethink
- Scottish Government
- Scottish Public Health Network
- SIGN
- Turning Point
- Welsh Government
- Who Health Evidence Network
- World Health Organisation

Citations from each search were downloaded into EndNote software and duplicates removed. Records were then screened against the eligibility criteria of the review before being appraised for methodological quality (see below). The unfiltered search results were saved and retained for future potential re-analysis to help keep the process both replicable and transparent.

NICE issued a call for evidence to stakeholders between January and February 2015, however, no additional studies were included for these review questions.

1.6 RETRIEVAL OF DATA AND FULL PAPER APPRAISAL

Titles and abstracts of identified studies were screened for inclusion against agreed criteria. Two reviewers independently screened 17% of references (selected randomly) and as inter-rater reliability was good (percentage agreement of 90%), the remaining references were screened by 1 reviewer.

All primary-level studies included after the first scan of citations were acquired in full and re-evaluated for eligibility (see Table 1: Review protocol summary for evidence review 1 (the epidemiology, and current configuration of health and social care community services, for people in the UK with a severe mental illness who also misuse substances) for inclusion/exclusion criteria) at the time they were entered into a study database (standardised template created in Microsoft Excel). Two researchers extracted data into the study database, comparing a sample of each other's work (10%) for reliability. Discrepancies or difficulties with coding were resolved through discussion between reviewers.

Study characteristics, aspects of methodological quality, and outcome data were extracted from all eligible studies, using Review Manager Version 5.3 (Cochrane Collaboration, 2014) and an Excel-based form.

1.7 QUALITY ASSESSMENT AND APPLICABILITY APPRAISING

For RQ 1.1, the quality of individual cohort and case-control studies was assessed using The Newcastle-Ottawa Scale (NOS), as recommended in the NICE Guidelines Manual (2014). Each study was judged on 3 broad areas: the selection of the study groups; the comparability of the groups; and the ascertainment of either the exposure or outcome of interest for case-control or cohort studies respectively. For RQ 1.2, the quality of individual studies was assessed using the AACODS checklist for studies of national, regional or local reports, assessments or evaluations adapted by NICE in the 'Interim methods guide for developing service guidance 2014' (checklist 1.5). Each study was judged on 6 broad areas: authority; accuracy; coverage; objectivity; date; and significance.
Each study was rated ++, + or - to denote its quality, where ++ indicates that all or most of the checklist criteria have been fulfilled (and where they have not been fulfilled the conclusions are very unlikely to alter), + indicates that some of the checklist criteria have been fulfilled (and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter) and – indicates that few or no checklist criteria have been fulfilled (and the conclusions are likely or very likely to alter). Quality assessment was conducted by 1 reviewer and a sample of assessments (10%) were checked by another reviewer. See Appendix 2 and

Appendix 3 for an example completed quality checklist for RQ 1.1 and RQ 1.2 respectively. The review team also considered the applicability of individual studies to the review question.

1.8 METHODS OF DATA EXTRACTION, SYNTHESIS AND PRESENTATION

Data extraction

The data extracted (where available) were as follows:

- Study characteristics: RQ addressed, study design, geographical region, service setting, N, year/s of data collection, inclusion/exclusion criteria, sampling frame, severe mental illness, diagnostic criteria/status, substance misuse, method of substance misuse assessment, demographics (age, sex, ethnicity), study limitations (as identified by the authors of the paper and by the review team)
- RQ 1.1: Outcomes: Outcome name, outcome measure, outcome rater, outcome data (for instance, prevalence of dual diagnosis, prevalence of coexisting conditions, prevalence of social care needs [housing, employment rate], relationship between severe mental illness and substance misuse [correlation])
- RQ 1.2: Outcomes: Outcome name, outcome measure, outcome rater, outcome data (for instance, staffing levels, transfer/referral times, time to assessment and diagnosis, time to treatment, waiting times, met/unmet treatment needs, service capacity, number of missed appointments, treatment adherence), model of current care pathway

Data synthesis

Narrative synthesis

Data were synthesised using narrative synthesis methods. The initial intention was to produce a 'problem-oriented' conceptual model to describe and summarise the current clinical understanding of the relevant characteristics of people with coexisting severe mental illness and substance misuse and describe the baseline configuration of health and social care community services and the current care pathway through which people with coexisting severe mental illness and substance misuse are detected, diagnosed, treated and followed-up. However, this was not possible on the basis of the available data.

Wherever possible, subgroup analyses were conducted, based on narrative synthesis methods. In addition to giving specific consideration to the equality and equity issues identified above, subgroup analyses were performed, including by:

- geographical location (rural; urban)
- service setting (primary care; secondary mental health care [community mental health teams, early intervention services, crisis resolution teams, assertive outreach teams]; substance misuse services)

- assessment method (consensus method [structured diagnostic interview combined with at least 1 other source]; self-report using formal diagnostic interviews; self-report using screening instrument; staff ratings)
- timescales for assessing comorbidity (lifetime; 1 year; 6 months; current)

Meta-analysis

Where possible, meta-analysis, using Review Manager, was performed to synthesise evidence across studies for the comparison of prevalence, health and social care needs between groups (predominantly between a dual diagnosis group and a severe mental illness-only or substance misuse-only group).

Dichotomous outcomes were analysed as odds ratios (ORs) with the associated 95% confidence interval (CI). The odds ratio compares the probability of something happening in 1 group with the probability of it happening in another. An odds ratio of 1 indicates that the probability of an event is the same for both groups. An odds ratio of greater than 1 means that the event is more likely in the first group than the second. An odds ratio of less than 1 means that the event is less likely in the first group than in the second group. Odds ratios are more difficult to interpret than relative risk ratios, however, odds ratios have certain favourable mathematical qualities. Relative risk describes the risk of developing the given condition in the exposed group as compared (relative to) the risk of developing the given condition in an unexposed (or differing exposure) group. Whereas, odds ratios do not imply temporality (that 1 condition comes before another), an odds ratio is an association (the odds of having 1 condition or exposure if you have another), and can be calculated for cross-sectional or case-control studies where we do not know which one of either condition or exposure preceded the other.

The Mantel-Haenszel statistical method (Mantel 1959, Greenland 1985) using the random-effects analysis model (which incorporates an assumption that the different studies are estimating different, yet related, intervention effects) were used to meta-synthesise dichotomous data. The odds ratio cannot be calculated for a study if there are no events in the control group as this would involve dividing by zero. However, to correct for situations such as these (where standard errors cannot be computed), Review Manager automatically adds 0.5 to each cell of the 2x2 table.

Continuous outcomes were analysed using the mean difference (MD) or standardised mean difference (SMD) when different measures were used in different studies to estimate the same underlying effect. The inverse-variance random-effects method was used to meta-synthesise continuous data.

Heterogeneity

To check for consistency of effects among studies, both the I^2 statistic and the chi-squared test of heterogeneity, as well as a visual inspection of the forest plots were used. The I^2 statistic describes the proportion of total variation in study estimates that is as a result of heterogeneity (Higgins & Thompson, 2002). The I^2 statistic was interpreted in the following way based on Higgins and Green (2011):

- 0 to 40%: might not be important

- 30 to 60%: may represent moderate heterogeneity
- 50 to 90%: may represent substantial heterogeneity
- 75 to 100%: considerable heterogeneity.

The Cochrane Collaboration advice suggests that overlapping categories are less misleading than simple thresholds since the importance of inconsistency depends on (a) the magnitude and direction of effects, and (b) the strength of evidence for heterogeneity (for example, p value from the chi-squared test, or a CI for I^2).

Analysis or re-analysis of individual study data

To ensure comparable effect estimates across studies for data that could not be meta-analysed, individual study data were analysed (or re-analysed) using the fixed-effect Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes.

REVIEW QUESTION 1.1: What are the health and social care needs of people in the UK with a severe mental illness who also misuse substances?

1.9 STUDIES CONSIDERED FOR REVIEW QUESTION 1.1

The electronic database search (including the citation search) for RQ 1.1 identified 12,234 records. Of these, full-text appraisal was conducted for 501 (and 11,733 were excluded on the basis of title and abstract). An additional 5 papers were included through handsearching methods and 4 included through citation searches. After full-text review, and removal of duplicates, 36 studies were included (reported across 43 papers). See Appendix 4 for PRISMA diagram, Appendix 6 for a bibliography of included studies and Appendix 7 for a bibliography of excluded studies with reasons for exclusion.

Twenty cohort and 16 case-control studies were included, with sample sizes ranging from 24 to 527,185 (mean: 16,596). Nearly half of the studies (N=16) were conducted in an urban area, predominantly London, 2 in suburban settings, 2 in semi-rural settings and 13 in mixed settings (geographical location was not reported for 3 studies). See Appendix 11 for full evidence tables.

1.10 SUMMARY OF THE EVIDENCE FOR REVIEW QUESTION 1.1

Prevalence of dual diagnosis in different service settings

Thirty-one of the studies reported prevalence data for dual diagnosis. Service settings and sampling frames varied across studies and thus prevalence rates were estimated as a percentage of the total population in a catchment area, as a percentage of the individuals with severe mental illness in a catchment area, or as a percentage of caseloads of secondary mental health services, substance misuse services or GP practices. Some studies also used a case-control design to examine the risk of comorbidity by comparing disorder and no-disorder groups.

Comprehensive catchment area surveys

Seven studies (Boys et al. 2003; Cantwell 2003; Coulthard et al. 2002; Duke et al. 2001; Houston et al. 2011; McCreadie 2002; Voshaar et al. 2011) reported prevalence data for dual diagnosis obtained using a comprehensive catchment area

survey sampling frame. Many of these studies were secondary analyses of larger datasets but were included where unique outcome data were reported. Three additional studies (Coid et al. 2006a; McManus et al. 2009; Wiles et al. 2006) also used a comprehensive catchment area survey but did not report prevalence data. See Table 2 for summary study characteristics of included studies using comprehensive catchment area surveys and Appendix 11 for full evidence tables.

Coulthard et al. (2002), a case-control study (+), reported secondary analyses of data from the survey of psychiatric morbidity among adults [16-74 years] living in private households in England, Wales, and Scotland (Singleton et al. 2001) and found that 0.13% of the total sample (11/8580) met criteria for probable psychosis (2 of 4 criteria present from the Psychosis Screening Questionnaire; Bebbington & Nayani, 1994) and comorbid (mild, moderate or severe) alcohol dependence (assessed using the Severity of Alcohol Dependence Questionnaire [SADQ]). This study found a slightly lower prevalence figure for drug dependence, with 0.05% of the total sample (4/8580) meeting criteria for both probable psychosis and past year dependence on any of 6 drugs (cannabis, amphetamines, crack, cocaine, ecstasy, tranquillisers and opiates) as indicated by a positive response to any of the following: daily drug use for two weeks or more; stated dependence; inability to cut down; need for larger amounts; withdrawal symptoms.

Houston et al. (2011), a case-control study (++), reported secondary analyses of the more recent, 2007 version of the Adult Psychiatric Morbidity Survey (McManus et al. 2009) and found that 0.07% of the total sample (5/7394) had an ICD-10 diagnosis of schizophrenia or affective psychosis and met criteria for hazardous alcohol use (Alcohol Use Disorders Identification Test [AUDIT] score>8) and 0.16% of the total sample (12/7394) had a diagnosis of severe mental illness and reported having used cannabis in their lifetime. Houston and colleagues also compared participants with psychosis to participants without psychosis and found a statistically significant difference between groups with a higher rate in the dual diagnosis group for lifetime cannabis use (12/29 versus 1687/7365; OR 2.38 [1.13, 4.98]; p=0.02). The same comparison was made for hazardous alcohol use (AUDIT score >8) but no statistically significant difference was found between psychosis and no psychosis groups (5/29 versus 1614/7365; OR 0.74 [0.28, 1.95]; p=0.55).

Boys et al. (2003), a case-control study (++), also compared prevalence rates for regular drinking or lifetime cannabis use between disorder and no-disorder groups, in this case a group with depression (N=66) compared to participants with no psychiatric diagnosis (N=2317) using data from participants in the 13-15 year age group who had participated in the Office for National Statistics (ONS, 1999) national mental health survey. This study found that depressive disorder doubled the probability of regular drinking (adjusted OR=1.97, p<0.05) and of lifetime cannabis use (adjusted OR=2.37, p<0.05).

Duke et al. (2001), a cohort study (-), used a comprehensive census survey to identify people living in permanent or temporary accommodation in South Westminster (postal district of SW1) with severe chronic mental illness and to assess comorbid non-alcohol substance misuse. This study found that 4.9% (13/265) of

individuals with schizophrenia or related psychoses (ICD-9 diagnoses) reported misuse of substances other than alcohol in the previous month (assessed using the Substance Use Rating Scale, patient version [SURSp]; Duke et al. 1994) and 21.5% (57/265) reported a lifetime history of non-alcohol substance misuse.

Voshaar et al. (2011), a case-control study (-), used a complete national clinical sample of all people that had been in contact with mental health services in the 12 months prior to their death by suicide (National Confidential Inquiry into Suicide and Homicide by People with Mental Illness; Appleby et al. 2001) to identify participants with a primary ICD-10 diagnosis of depressive disorder who were aged at least 60 years old at the time of suicide. Prevalence of comorbid ICD-10 diagnosis of alcohol dependence or misuse was 7.0% (59/839) and for drug dependence or misuse was 1.9% (16/839). This study also found that the rate of alcohol dependence or misuse was doubled amongst those with early-onset relative to late-onset depressive illness (30/290 [10%] versus 29/549 [5%]; OR 2.07 [1.22, 3.52]; p=0.007). No statistically significant association between age of onset and drug dependence or misuse was found (5/290 versus 11/549; OR 0.86 [0.30, 2.49]; p=0.78).

Cantwell (2003) and McCreadie (2002), 2 case-control studies (++), both reported on the Scottish Comorbidity Study that used a 'key informant' method (GPs, social workers and voluntary agencies were contacted and asked to identify any patients with severe mental illness living in the local area who were known to them) to identify individuals with schizophrenia known to primary or secondary care services in 3 rural and inner city sites—Nithsdale, Glasgow and Aberdeen. Cantwell (2003) reported that amongst individuals with an ICD-10 diagnosis of schizophrenia, 20.3% (64/136) and 44.6% (141/316) also met diagnostic criteria for harmful drug and/or alcohol use or dependence in the past year or before the past year respectively (assessed using the Schedules for Clinical Assessment in Neuropsychiatry [SCAN]). When alcohol and drug misuse were considered separately, prevalence estimates of 15.5% (49/316) and 38.6% (122/316) were found for harmful alcohol use or dependence in the past year or before the past year respectively, and 7.0% (22/316) and 20.9% (66/316) for harmful drug use or dependence using the same timescales for assessing comorbidity. McCreadie (2002) compared people with schizophrenia to general population controls (matched on gender, age and postcode area of residence) and found a greater probability of harmful drug use, drug dependence or problem drug use amongst patients with schizophrenia in the past year (49/250 [20%] versus 12/250 [5%]; OR 4.83 [2.50, 9.34]; p<0.00001) or at any time before the previous year (136/250 [54%] versus 38/250 [15%]; OR 6.66 [4.35, 10.19]; p<0.00001), and for harmful alcohol use, alcohol dependence or problem alcohol use in the past year (100/250 [40%] versus 55/250 [22%]; OR 2.36 [1.60, 3.50]; p<0.0001) or at any time before the previous year (243/250 [97%] versus 189/250 [76%]; OR 11.20 [5.01, 25.06]; p<0.00001).

Table 2: Study characteristics of included studies using comprehensive catchment area surveys

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Boys et al. 2003 [ONS national mental health survey] Case-control (++) N: 2624	13-15 (mean NR)	50	90	England, Scotland and Wales	Mixed	NR	Assessment based on ICD-10 and DSM-IV diagnostic criteria and supplemented by open-ended questions. Clinical raters (blind to substance use) assigned diagnosis	ONS national surveys of drinking and drug use; Current (alcohol) and Lifetime (cannabis)
Cantwell 2003 [Scottish Comorbidity Study] Case-control (++) N: 316	Range NR (mean: 45.3)	38	NR	Scotland	Mixed	20.3% current drug and/or alcohol; 44.6% lifetime drug and/or alcohol; 7.0% current drug; 20.9% lifetime drug; 15.5% current alcohol; 38.6% lifetime alcohol	Consensus diagnosis of schizophrenia according to ICD-10 research diagnostic criteria (based on case notes)	Sections 11 and 12 of SCAN.Participants were identified as having problem use if they met ICD-10 research criteria for harmful use or dependence; Current and lifetime
Coid et al. 2006a [APMS, 2001] Case-control (+) N: 5330	NR	NR	NR	England, Scotland and Wales	Mixed	NR	Participants screened positive for psychosis if any 2 of 4 criteria were currently present from PSQ	Alcohol misuse was assessed using the AUDIT (score≥8) and alcohol dependence using the SADQ. Positive responses regarding a series of different substances (cannabis, amphetamines, cocaine, crack cocaine, ecstasy, tranquilisers, opiates, and volatile substances) to any of the 5 questions measuring drug dependence over the past year were combined to produce a single category of "any" drug dependence; 6 months (alcohol), 1 year (drugs)
Coulthard et al. 2002 [APMS, 2001]	NR	NR	NR	England, Scotland and Wales	Mixed	0.05 drug; 0.13 alcohol	Participants screened positive for psychosis if any 2 of 4 criteria were	Alcohol misuse was assessed using the AUDIT (score≥8) and alcohol dependence using the SADQ.

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Case-control (+) N: 8580							currently present from PSQ	Positive responses regarding a series of different substances (cannabis, amphetamines, cocaine, crack cocaine, ecstasy, tranquilisers, opiates, and volatile substances) to any of the 5 questions measuring drug dependence over the past year were combined to produce a single category of "any" drug dependence; 6 months (alcohol), 1 year (drugs)
Duke et al. 2001 Cohort (-) N: 337	Range NR (mean: 50.3)	46	77	London (Westminster)	Urban	4.9 current; 21.5 lifetime	ICD-9 diagnosis of schizophrenia, schizoaffective disorder or paranoid psychosis (based on a detailed questionnaire and case note review)	Substance misuse was assessed using the SURSp; Current and lifetime
Houston et al. 2011 [APMS, 2007] Case-control (++) N: 7394	Range NR (mean: 51.1)	51	90	England	Mixed	0.07 current alcohol; 0.16% lifetime cannabis	ICD-10 diagnosis of schizophrenia or affective psychosis (based on SCAN)	Hazardous alcohol use (AUDIT score >8); Current
McCreadie 2002 [Scottish Comorbidity Study] Case-control (++) N: 500	Range NR (mean: 45)	43	NR	Scotland	Mixed	NR	Consensus clinical diagnosis of schizophrenia and case records examined to complete the OPCRIT to generate ICD-10 and DSM-IV diagnoses	ICD-10 diagnosis of harmful drug use, drug dependence or problem drug use (measured using sections 11 and 12 of SCAN); 1 year
McManus et al. 2009 [APMS, 2007]	NR	NR	NR	England	Mixed	NR	ICD-10 diagnosis of psychotic disorder (assessed using SCAN; past year)	Alcohol dependence (screen positive on AUDIT and SADQ-C); 6 months

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Cohort (+) N: 7461								
Voshaar et al. 2011 [National Confidential Inquiry into Suicide and Homicide by People with Mental Illness] Case-control (-) N: 839	Range NR (mean: 70.6)	44	96	England and Wales	Mixed	1.9 drug; 7.0 alcohol	ICD-10 diagnosis of depressive disorder (from case notes)	ICD-10 diagnosis of alcohol or drug dependence or misuse (from case notes); Current
Wiles et al. 2006 [APMS, 2001] Cohort (+) N: 1795	NR	NR	NR	England, Scotland and Wales	Mixed	NR	Self-reported psychotic symptoms (within 18 month follow-up measured using PSQ)	Harmful drinking (AUDIT score ≥16) and dependency on cannabis (based on positive response to 1/5 questions: daily use for ≥2 weeks; self-reported dependence; inability to cut down; need to use larger quantities to get an effect; symptoms of withdrawal); 18 months

Notes: NR = not reported. See glossary for other abbreviations and further details on scales (where available)

Quality rating: ++ (All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter); + (Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter); - (Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter)

Evidence Statement 1.1.1: Prevalence in comprehensive catchment area surveys

There is moderate evidence from 6 case-control studies (4 [++][1,2,5,6] , 1 [+][3] and 1 [−][7]) and 1 cohort study [-][4] about the prevalence of dual diagnosis obtained using a comprehensive catchment area survey sampling frame. The evidence about the rates of dual diagnosis are fairly consistent. Two large case-control studies (1 [++][5] and 1 [+][3]) found a prevalence of dual diagnosis in the general adult UK population of 0.05-0.16%. Another 3 studies (1 [++] case-control[2], 1 [-] case-control[7] and 1 [-] cohort[4]) that restricted their comprehensive catchment area survey to people with severe mental illness found prevalence rates of 1.9-7.0% for current harmful drug use or dependence and 7.0-15.5% for current harmful alcohol use or dependence.

There is strong evidence from 3 case-control studies [++][1,5,6] about differences in the rates of substance misuse problems between groups with severe mental illness and a group with no psychiatric diagnosis, no psychosis or compared to general population controls. Consistently higher rates of drug misuse were observed for children[1] and adults[5,6] with severe mental illness (adjusted OR=2.37, $p<0.05$[1] and OR 2.38 [1.13, 4.98], $p=0.02$[5] for lifetime cannabis use; OR 4.83 [2.50, 9.34], $p<0.00001$[6] for harmful drug use/dependence in past year). However, the evidence for alcohol misuse was more mixed, with 1 study [++][5] in adults finding no significant difference in hazardous alcohol use between psychosis and no psychosis groups, and the other 2 studies (1 [++] in children[1] and 1 [++] in adults[6]) finding greater rates of regular alcohol use or dependence for children with depressive disorder (adjusted OR=1.97, $p<0.05$)[1] or adults with schizophrenia (OR 2.36 [1.60, 3.50], $p<0.0001$)[6].

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. Moreover, the surveys were designed to recruit samples that were representative of the population living in community settings.

[1]Boys et al. 2003 (++)
[2]Cantwell 2003 (++)
[3]Coulthard et al. 2002 (+)
[4]Duke et al. 2001 (-)
[5]Houston et al. 2011 (++)
[6]McCreadie 2002 (++)
[7]Voshaar et al. 2011 (-)

Secondary mental health services

Twenty-one studies (Afuwape et al. 2006; Barnett et al. 2007; Commander & Odell, 2001; Dominguez et al. 2013; Donoghue et al. 2011; Donoghue et al. 2014; Gaite et al. 2002; Hipwell et al., 2000; Leeson et al. 2012; Miles et al. 2003; Priebe et al. 2003/Fakhoury & Priebe 2006 [1 study reported across 2 papers]; Rao et al. 2007/Trathen et al. 2007 [1 study reported across 2 papers]; Rowlands 2001; Schulte & Holland 2008; Turkington et al. 2009; Verdolini et al. 2014; Virgo et al. 2001; Weaver et al. 2001a; Weaver et al. 2001b; Weaver et al. 2003/2004; Wright et al. 2000/2002 [1 study reported across 2 papers]) reported prevalence data for comorbid substance misuse amongst individuals with severe mental illness who were in contact with secondary mental health services. An additional study (Tyler et al. 2015) sampled from secondary mental health services but did not report prevalence data. See Table 3 for summary study characteristics of included studies that sampled from secondary mental health settings and Appendix 11 for full evidence tables.

Across secondary mental health service settings, Wright et al. (2000/2002), a case-control study (++), found that 32.5% (13/40) of adult mental health service patients with severe mental illness had comorbid self-reported (South Westminster Substance Misuse Questionnaire [Duke et al., 1994]) and/or staff-rated substance misuse. Rao et al. (2007)/Trathen et al. (2007), a case-control study (-), found that 61.2% (1107/1808) of the caseload of a mental health partnership NHS trust (all inpatients [5%], all CMHT patients [50%], all patients from the drug and alcohol service [13%], and a random sample of psychiatric outpatients [32%]) had a diagnosis of severe mental illness (psychotic disorder or any mental disorder if it was associated with a high risk of self-harm or violence) and substance use disorder (from case notes). Gaite et al. (2002), a cohort study (-), found that 75% (63/84) of caseloads of specialist mental health services (inpatient, outpatient and community) had a previous history of alcohol abuse and 70% (59/84) of other drugs abuse. While, Leeson et al. (2012), a case-control study (+), found that 65.7% (65/99) of secondary mental health service patients with psychosis met diagnostic criteria for lifetime cannabis use.

Prevalence estimates, from 5 cohort (4 [++] and 1 [-]) and 2 case-control (2 [-]) studies, of comorbid substance abuse or dependence amongst Community Mental Health Team (CMHT) caseloads ranged from 11.7% to 44.0% (Afuwape et al. 2006; Rao et al. 2007/Trathen et al. 2007; Schulte & Holland 2008; Virgo et al. 2001; Weaver et al. 2001a; Weaver et al. 2001b; Weaver et al. 2003/2004).

Priebe et al. (2003)/Fakhoury & Priebe (2006), a cohort study (++), examined the prevalence of dual diagnosis amongst assertive outreach team caseloads and found that 29% (168/580) had a diagnosis of severe mental illness (from case notes) and staff-rated substance misuse (clinician-rated scales for drug and alcohol use; Drake et al. 1989).

Two cohort (2 [-]) studies (Donoghue et al. 2011; Rowlands 2001) and 1 case-control (++) study (Turkington et al. 2009) examined prevalence of comorbid substance

misuse amongst individuals presenting to psychiatric services with first-episode psychosis and found estimates ranged from 15.1% to 46.4%. Higher prevalence estimates were observed in a 16-29 year group (23.2%; Donoghue et al. 2011), if restricted to first-episode schizophrenia (50.5%; Turkington et al. 2009) and if the timescale for assessing comorbidity was lifetime (51.2-59.4%; Donoghue et al. 2014; Rowlands 2001). Two cohort studies (1 [+] and 1 [-]) found that amongst consecutive referrals to specialist early intervention services for first-episode psychosis, the prevalence estimates for lifetime cannabis use ranged from 55.5% to 66.4% (Barnett et al. 2007; Dominguez et al. 2013).

Hipwell et al. (2000), a case-control study (-), found that 23.5% (16/68) of clients with severe mental illness who were attending a day hospital service were identified by their keyworker as a regular substance user.

Verdolini et al. (2014), a cohort study (-), examined the percentage of treatment-seeking bipolar clients assessed at an initial psychiatric assessment clinic who use substances and found that 39.7% (27/68) and 49.3% (33/67) used alcohol currently or in the past respectively, and 22.6% (14/62) and 56.7% (34/60) used illicit drugs currently or in the past.

Commander and Odell (2001), a case-control study (+), recruited participants through a specialist psychiatric service for people with severe mental illness who were homeless and found that 30.8% (24/78) of participants met criteria for a substance use problem (abuse, dependence or severe dependence) in the past 6 months, as assessed by keyworker-completed schedule (Drake et al. 1989). This study also compared homeless cases against CMHT controls who were never homeless and analysis conducted by the review team found statistically significant differences with greater rates in the homeless group for a substance use problem (21/39 [54%] versus 3/39 [8%]; OR 14.00 [3.68, 53.23]; p=0.0001), an alcohol use problem (13/39 [33%] versus 3/39 [8%]; OR 6.00 [1.55, 23.21]; p=0.009), a non-prescribed drug use problem (14/39 [36%] versus 0/39 [0%]; OR 44.92 [2.57, 786.62]; p=0.009) and a DSM-IV diagnosis of substance-induced psychosis (9/39 [23%] versus 0/39 [0%]; OR 24.61 [1.38, 439.57]; p=0.03).

A meta-analysis of 3 cohort studies (3 [++]) and 1 case-control study (1 [+]) (N=1927; Leeson et al. 2012, Priebe et al. 2003/Fakhoury & Priebe 2006, Virgo et al. 2001, Weaver et al. 2001a) compared the probability of a severe mental illness diagnosis between cases with substance use/misuse problems and controls with no substance use/misuse (see Appendix 10, forest plot 1.1) and found no association between concurrent substance use/misuse and schizophrenia (OR 0.93 [0.68, 1.27], p=0.63; I^2=32%). However, a single cohort (++) study (Virgo et al. 2001) found that the proportion of adult mental health service patients with a diagnosis of depression was almost doubled for cases with substance misuse/dependence relative to controls without substance misuse problems (20/85 [24%] versus 52/370 [14%]; OR 1.88 [1.05, 3.36]; p=0.03). Miles et al. (2003) compared the rates of a diagnosis of schizophrenia or bipolar affective disorder between substance misuse groups (alcohol-only, alcohol and cannabis, cannabis-only and stimulants-only) and found no statistically significant differences (p=0.51-0.96).

Table 3: Study characteristics of included studies in secondary mental health services

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Afuwape et al. 2006 [COMO study] Cohort (+) N: 1432	Range NR (mean: 37.5)	16	55	London (south)	Urban	Caseloads of CMHTs	14.9	Diagnosis of psychosis (from clinical case notes)	Rating of substance abuse, dependence or dependence with institutionalization based on AUS or DUS; 6 months
Barnett et al. 2007 Cohort (+) N: 123	17-65 (mean NR; Median: 25)	24	NR	Cambridge	Urban	Consecutive referrals to a specialist early intervention service for people who experience a first episode of psychosis	66.4	Consensus DSM-IV diagnosis of psychosis (SCID)	Substance use assessed using the St George's Substance Abuse Assessment Questionnaire. substance use was classified according to DSM-IV criteria; Lifetime
Commander & Odell 2001 Case-control (+) N: 78	22-56 (mean: 38)	8	82	Birmingham	Urban	Cases were identified through a specialist psychiatric service for people with severe mental illness who are homeless in Birmingham. Controls were randomly selected from within the same age/sex group and were drawn from a list of patients fulfilling the inclusion criteria on the caseload of an inner city CMHT	30.8	DSM-IV lifetime diagnosis of schizophrenia or other psychotic disorder	A key-worker completed schedule (Drake, 1989) was used to rate substance use problems (abuse, dependence and severe dependence); 6 months
Dominguez et al. 2013 Cohort (-) N: 940	Range NR (mean: 23)	36	34	London	Urban	Consecutive referrals to nine early intervention services for psychosis	55.5	Diagnosis of first episode psychosis (clinical assessment with access to clinical records)	Keyworker-rated use of cannabis (rated using the Drake Substance Misuse Scale; Drake et al. 1996); Lifetime
Donoghue et al. 2011 [AESOP & SIN study]	16-64 (mean NR)	41	76	Nottingham	Urban	Potential cases presenting to psychiatric services over a 2-year period with a first-	15.1	Consensus diagnosis of a psychotic disorder according to ICD-10 criteria (based on	Self-report of drug use and consensus diagnostic meeting where ICD-10 diagnoses of comorbid

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Cohort (-) N: 371						episode of psychosis; Secondary analysis of data from SIN and AESOP		SCAN or the IGC completed from case notes for participants declining interview)	substance harmful use or dependence were assigned; Current
Donoghue et al. 2014 [AESOP study] Case-control (++) N: 143	Range NR but inclusion criteria 16-45 years (mean: 27.9)	39	41	London (south east) and Nottingham	Urban	Presentations of first-episode psychosis to mental health services (all points of secondary mental health contact were monitored to identify all potential cases of first-episode psychosis)	59.4	Consensus diagnosis of schizophrenia or schizoaffective disorder according to ICD-10 criteria (based on SCAN or the IGC for participants declining interview)	Any use at all of cannabis before the first contact with mental health services assessed using the PPHS, which included information provided by a relative or carer, the SCAN and clinical case notes; Lifetime
Gaite et al. 2002 [EPSILON study] Cohort (-) N: 84	Range NR but inclusion criteria 18-65 years (mean: 43.8)	42	66	London	Urban	Caseloads of local specialist mental health services (inpatient, outpatient and community)	75 lifetime alcohol; 70 lifetime drug	ICD-10 diagnosis of any psychotic disorder	Outcome measure NR: Alcohol/drug abuse; Lifetime ('previous history')
Hipwell et al. 2000 Case-control (-) N: 32	19-53 (mean: 33.4)	38	NR	NR	Semi-rural	Attenders of a day hospital service (part of a Community Mental Health Centre) which provides comprehensive care and intensive crisis support for individuals with severe and enduring mental illness	23.5	Diagnosis of schizophrenia or schizoaffective illness (no further detail reported)	Keyworkers identified current attenders who were regularly using substances (i.e. 3 or more times per week); Current
Leeson et al. 2012 Case-control (+) N: 99	Range NR (mean: 25.1)	35	NR	London (west)	Urban	Inpatients and outpatients with a first-psychotic episode	65.7	DSM-IV diagnosis of psychosis (based on the DIP-DM)	Cannabis use (assessed using the semistructured interview within the DIP-DM); Lifetime
Miles et al. 2003 [COMO study] Case-control (-)	17-77 (mean: 37.5)	17	49	London	Urban	Caseloads of CMHTs	14.9 (duplicate data from Afuwape et al. 2006)	ICD-10 diagnosis (made by psychiatrists and recorded in case notes) of schizophrenia, schizoaffective disorder, bipolar	Rating of substance abuse, dependence or dependence with institutionalization based on AUSand DUS; 6 months

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
N: 1560								affective disorder, or delusional disorder	
Priebe et al. 2003/ Fakhoury et al. 2006 [Pan-London Assertive Outreach Study] Cohort (++) N: 580	Range NR (mean: 36.7)	37	56	London	Urban	Assertive outreach teams. The sample consisted of all new patients (those who had joined the caseload in the previous 3 months) and a random 0.37 fraction of established patients (been with the team for 3 months or longer) from each team.	29	Diagnosis of SMI (from case notes)	Clinician rated scales on alcohol or drug use (Drake et al., 1989)
Rao et al. 2007/ Trathen et al. 2007 Case-control (-) N: 1808	16-64 (mean NR for whole sample)	NR (for whole sample)	NR (for whole sample)	Harlow and surrounding area of South East England	Semi-rural	All inpatients (5%), all CMHT patients (50%), all patients from the drug and alcohol service (13%), and a random sample of psychiatric outpatients (32%)	61.2 (total sample); 21.7 (CMHT); 24 (addiction service)	Diagnosis of psychotic disorder based on the working diagnosis made by the appropriate multidisciplinary team (including schizophrenia, bipolar affective disorder and severe depression) or any mental disorder if it was associated with a high risk of self-harm or violence	Substance use disorder (no further detail reported); Current
Rowlands 2001 Cohort (-) N: 84	17-71 (mean NR; medians: 21-43)	42	NR	North Derbyshire	Mixed	Catchment area survey (using 'key informant' method to identify incident cases of psychosis known to CMHTs and consultants)	46.4 current; 51.2 lifetime	Diagnosis of psychosis (collected from the clinicians involved in delivering assessments and intervention to the individuals concerned)	Substance misuse (from case notes); Current and lifetime
Schulte & Holland 2008 Cohort (-) N: 2454	NR	NR	NR	Manchester	Urban	Secondary analysis of internal Trust reports (survey sent to all CMHTs, the assertive outreach and home option team)	35.1	Revised MARC II questionnaire (simple one-page form to gather client details, e.g. type of mental illness, drug/alcohol use and level of engagement). Secondary data from	Misuse of drugs and/or alcohol (outcome measure NR); timescale NR

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
								survey was not specific to SMI but majority had SMI (at least 81%)	
Turkington et al. 2009 [NIFEPS] Case-control (++) N: 188	18-64 (mean: 34.2)	37	NR	Belfast City and County Antrim area	Mixed	All incident cases of psychosis presenting to general psychiatric services	43	ICD-10 diagnosis of psychosis (based on case note analysis using the OPCRIT)	Substance abuse or dependence based on PPHS; 1 year
Tyler et al. 2015 Cohort (-) N: 24	Range NR (mean: 37.1)	33	92	England (north-west)	NR	Recruited from 4 mental health trusts in the North-West of England, self-help organisations (Bipolar UK and Mood Swings Network) and self-referral from the online University of Manchester research volunteering website	NR	DSM-IV diagnostic criteria for bipolar disorder type I or II, as determined by the SCID	To be included participants were required to report using cannabis on at least 2 occasions per week (in at least half the weeks in the 3 months prior to assessment) assessed using the substance use module of the SCID
Verdolini et al. 2014 Cohort (-) N: 70	8-61 (mean: 35)	61	94	Bedford	NR	Treatment-seeking adults with bipolar disorder seen at an initial psychiatric assessment clinic	39.7 (current alcohol); 49.3 (lifetime alcohol); 22.6 (current drug); 56.7 (lifetime drug)	ICD-10/DSM-IV-TR diagnosis of bipolar (from case notes)	Alcohol or illicit drug use (from case notes); Current and lifetime
Virgo et al. 2001 Cohort (++) N: 1021	NR (for whole sample)	NR (for whole sample)	NR (for whole sample)	Dorset (eastern)	Mixed	All persons who were patients on a specific day (15.01.97) at an acute hospital (10%), residential and day treatment and rehabilitation units (19%), group therapy treatment unit (8%), addictions service including community drug and alcohol teams, a detoxification ward and an abstinence-oriented	55 (total sample); 11.7 (CMHTs); 12.1 (addiction services)	Diagnosis of SMI (from case notes)	Keyworker ratings of substance misuse (using Clinician Rating Scales for alcohol and other drugs); 6 months

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
						day treatment unit (31%) and a random sample of patients at CMHTs (33%)			
Weaver et al. 2001a Cohort (++) N: 1121	Range NR (mean: 44.9 [for SMI sample; N=851])	44 (for SMI sample; N=851)	55 (for SMI sample; N=851)	London (Hammersmith & Fulham)	Urban	Caseloads of CMHTs	24.4	Diagnosis of psychosis (from case notes)	Keyworker-reported drug and/or alcohol consumption that met DSM-IV criteria for misuse of drug and/or alcohol; Current
Weaver et al. 2001b Cohort (++) N: 1298	17-86 (mean NR; median: 38-45)	42	70	London (Hammersmith & Fulham)	Urban	Caseloads of CMHTs and substance misuse services	24.4 (CMHTs); 5.7 (addiction services)	ICD-10 diagnosis of non-substance-induced psychotic disorders (including schizophrenia, manic depression, bipolar affective disorder) (from case notes)	Keyworker-reported drug and/or alcohol consumption that met DSM-IV criteria for misuse of drug and/or alcohol; Current
Weaver et al. 2003/2004 [COSMIC study] Cohort (++) N: 560	18-68 (mean NR; median: 32-43)	39	81	London (Brent, and Hammersmith & Fulham), Nottingham and Sheffield	Urban	Caseloads of CMHTs and substance misuse services	41.4 (total sample); 44.0 (CMHTs); 38.9 (addiction services)	Participants in substance misuse services assessed for psychosis using the OPCRIT based on a case note review. Service-defined diagnoses were used to identify CMHT patients with psychosis	Harmful alcohol-related problems assessed using AUDIT (score≥8). A structured interview checklist identified drug types used and whether associated problems were present (economic, domestic, social, legal or interpersonal). Problem drug use defined as self-reported presence of 1 or more of the above drug-related problems or care coordinator assessment of misuse. The SDS assessed drug dependency. To assess the reliability of self-reported drug use in CMHT patients, a random subsample of participants also had hair and urine samples tested using chromatography and mass spectrometry analysis;

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
									Current; 1 year
Wright et al. 2000/2002 Case-control (++) N: 40	Range NR (mean: 41.4)	45	48	Croydon	Suburban	Random sample of caseload of Croydon Health Authority's mental health service in Central West Sector	32.5	Clinical diagnosis of any form of functional psychosis other than drug-induced psychosis (from case notes)	Self-reported (South Westminster Substance Misuse Questionnaire [Duke et al., 1994] and/or staff-rated substance misuse; Current

Notes: NR = not reported. See glossary for other abbreviations and further details on scales (where available)

Quality rating: ++ (All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter); + (Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter); - (Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter)

Sub-analysis for prevalence in secondary mental health care services

The combined prevalence across mental health settings for the fifteen studies that report data for current/recent coexisting substance misuse (within the last year) amongst individuals with severe mental illness in contact with secondary mental health care services was 34.3% (2997/8725; see Table 4). However, given the substantial heterogeneity between studies, this combined estimate is not necessarily meaningful.

A series of narrative sub-analyses were performed in order to investigate potential contributors to the inconsistency of prevalence estimates. Inconsistency could not be accounted for by methodological quality (as the lowest and highest estimates both come from high quality studies) or distinction between substance use, misuse or dependence. In addition, the timescale (current/recent versus lifetime) for assessing comorbidity and the service setting were controlled for in the comparison.

However, a number of other sub-analyses were indicative of differences:

- Sub-analysis by geographical location:
    - Higher prevalence (59.9%) in semi-rural locations (2 studies [Hipwell et al. 2000; Rao et al. 2007/Trathen et al. 2007]; N=1876;)
    - relative to suburban (32.5%) (1 study [Wright et al. 2000/2002]; N=40)
    - or urban (27.3%) locations (7 studies [Afuwape et al. 2006; Commander & Odell 2001; Donoghue et al. 2011; Priebe et al. 2003/Fakhoury & Priebe 2006; Schulte & Holland 2008; Weaver et al. 2001a/2001b; Weaver et al. 2003/2004; N=6127) .
- Sub-analysis by method of assessment of substance misuse:
    - Similar rates between consensus (15.1%) method (structured diagnostic interview combined with at least 1 other source; 1 study [Donoghue et al. 2011]; N=371) and staff ratings (21.0%) (5 studies [Afuwape et al. 2006; Commander & Odell 2001; Hipwell et al. 2000; Priebe et al. 2003/Fakhoury & Priebe 2006; Weaver et al. 2001a/2001b]; N=3088)
    - and then similar but somewhat higher estimates between documented diagnosis in case notes (43.4%) (2 studies [Rowlands 2001; Verdolini et al. 2014]; N=152), self-report using formal diagnostic interviews (43.1%) (1 study [Turkington et al. 2009]; N=188) and self-report using screening instrument (42.5%) (2 studies [Weaver et al. 2003/2004; Wright et al. 2000/2002]; N=322).
- Sub-analysis by year of data collection:
    - Lower rates for data collected pre-2000 (15.6%) (4 studies [Afuwape et al. 2006; Donoghue et al. 2011; Rowlands 2001; Virgo et al. 2001]; N=2229)
- than data collected post-2000 (44.0%) (6 studies [Priebe et al. 2003/Fakhoury & Priebe 2006; Rao et al. 2007/Trathen et al. 2007; Schulte & Holland 2008; Turkington et al. 2009; Verdolini et al. 2014; Weaver et al. 2003/2004]; N=5380) Sub-analysis by specific timescale:

- Lower rates for 6 months (18.3%) (4 studies [Afuwape et al. 2006; Commander & Odell 2001; Priebe et al. 2003/Fakhoury & Priebe 2006; Virgo et al. 2001; N=2432)
- than current (44.5%) (6 studies [Donoghue et al. 2011; Rao et al. 2007/Trathen et al. 2007; Rowlands 2001; Verdolini et al. 2014; Weaver et al. 2001a/2001b; Wright et al. 2000/2002]; N=3301)
- and 1 year (43.6%) (2 studies [Turkington et al. 2009; Weaver et al. 2003/2004]; N=470).

However, the results of these sub-analyses are very difficult to make sense of, given the number of dimensions on which these studies differ.

Table 4: Sub-analysis for prevalence estimates of current coexisting substance misuse amongst individuals with severe mental illness in contact with secondary mental health care services

Study ID	Geographical location	Method of assessment of substance misuse	Years of data collection	Specific timescale	Specific service setting	Count	N
Afuwape et al. 2006	Urban	Staff ratings	Pre-2000	6 months	CMHT	213	1432
Commander & Odell 2001	Urban	Staff ratings	NR	6 months	Specialist psychiatric service for homeless people	24	78
Donoghue et al. 2011	Urban	Consensus method (structured diagnostic interview combined with at least one other source)	Pre-2000	Current	General	56	371
Hipwell et al. 2000	Semi-rural	Staff ratings	NR	Current	Day Hospital	16	68
Priebe et al. 2003/Fakhoury & Priebe 2006	Urban	Staff ratings	Post-2000	6 months	Assertive outreach	168	580
Rao et al. 2007/Trathen et al. 2007	Semi-rural	NR	Post-2000	Current	General	1107	1808
Rowlands 2001	Mixed	Documented diagnosis in case notes	Pre-2000	Current	General	39	84
Schulte & Holland 2008	Urban	NR	Post-2000	NR (recent past)	CMHT	862	2454
Turkington et al. 2009	Mixed	Self-report using formal diagnostic interviews	Post-2000	1 year	General	81	188
Verdolini et al. 2014	NR	Documented diagnosis in case notes	Post-2000	Current	Psychiatric outpatient	27	68
Virgo et al. 2001	Mixed	NR	Pre-2000	6 months	CMHT	40	342
Weaver et al. 2001a/2001b	Urban	Staff ratings	NR	Current	CMHT	227	930
Weaver et al. 2003/2004	Urban	Self-report using screening	Post-2000	1 year	CMHT	124	282

Study ID	Geographical location	Method of assessment of substance misuse	Years of data collection	Specific timescale	Specific service setting	Count	N
		instrument					
Wright et al. 2000/2002	Suburban	Self-report using screening instrument	NR	Current	General	13	40
Combined studies						2997	8725

Evidence Statement 1.1.2: Prevalence in secondary mental health care services

There is moderate evidence from 9 cohort studies (4 [++][7,13,14,15], 1 [+][1] and 4 [-][3,9,10,12]) and 7 case-control studies (2 [++][11,16], 2 [+][2,5] and 3 [-][4,6,8]) about the prevalence of dual diagnosis amongst those in contact with secondary mental health services. This evidence was mixed with hugely varying prevalence rates across secondary mental health settings of between 11.7% and 61.2% for substance use/misuse/dependence within the past year. If data are combined across studies the prevalence rate is 34.3%, although given the considerable heterogeneity of studies this estimate should be interpreted with caution. Differences in prevalence estimates could not be accounted for by methodological quality (the lowest and highest estimates both come from high quality studies) or distinction between substance use, misuse or dependence. In addition, the timescale (current versus lifetime) for assessing comorbidity and service setting were controlled for in the comparison. However, a number of other sub-analyses were indicative of differences (although, given the number of dimensions on which studies differ it is very difficult to make sense of these differences):

- Geographical location: Higher prevalence in semi-rural (1 [++][7] and 1 [-][4]) relative to urban (3 [++][7,14,15], 2 [+][1,2] and 2 [-][3,10]) or suburban [++][16] areas with estimates of 59.9% relative to 27.3% and 32.5%
- Method of assessment of substance misuse: Broadly similar rates between consensus method (1 [-][3]) and staff ratings (2 [++][7,14], 2 [+][1,2] and 1 [-][4]) of 15.1% and 21.0% respectively, and then higher but similar estimates between documented diagnosis in case notes (2 [-][9,12]), self-report using formal diagnostic interviews [++][11] and self-report using screening instrument (2 [++][15,16]) of 43.4%, 43.1% and 42.5% respectively.
- Year of data collection: Lower rates for data collected pre-2000 (1 [++][13], 1 [+][1] and 2 [-][3,9]) than data collected post-2000 (3 [++][7,11,15] and 3 [-][8,10,12]) with estimates of 15.6% relative to 44.0%.
- Specific timescale: Lower rates for 6 months (2 [++][7,13] and 2 [+][1,2]) than current (2 [++][14,16] and 4 [-][3,8,9,12]) and 1 year (2 [++][11,15]) with estimates of 18.3% relative to 44.5% and 43.6%.

There is strong evidence from 3 cohort studies [++][7,13,14] and 1 case-control study ([+][5] about differences in the rates of severe mental illness diagnosis between cases with substance misuse problems and controls with no recorded substance misuse problems. However, the evidence is somewhat mixed. A meta-analysis of

these 4 studies found no significant association between concurrent substance use/misuse and schizophrenia (OR 0.93 [0.68, 1.27]; p=0.63; I^2=32%). One case-control study [-][6] found no statistically significant difference (p=0.51-0.96) in diagnoses of schizophrenia or bipolar affective disorder between substance misuse groups (alcohol-only, alcohol and cannabis, cannabis-only and stimulants-only). However, 1 study [++][13] found increased probability of a diagnosis of depression for adult mental health service patients with substance misuse/dependence relative to controls without substance misuse problems (OR 1.88 [1.05, 3.36], p=0.03).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence rates were estimated for individuals in contact with mental health services and, given that patients with a dual diagnosis may be at higher risk of disengagement from services, prevalence rates may be underestimated.

[1]Afuwape et al. 2006 (+)
[2]Commander & Odell 2001 (+)
[3]Donoghue et al. 2011 (-)
[4]Hipwell et al. 2000 (-)
[5]Leeson et al. 2012 (+)
[6]Miles et al. 2003 (-)
[7]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[8]Rao et al. 2007/Trathen et al. 2007 (-)
[9]Rowlands 2001 (-)
[10]Schulte & Holland 2008 (-)
[11]Turkington et al. 2009 (++)
[12]Verdolini et al. 2014 (-)
[13]Virgo et al. 2001 (++)
[14]Weaver et al. 2001a and Weaver et al. 2001b (duplicate data) (++)
[15]Weaver et al. 2003/2004 (++)
[16]Wright et al. 2000/2002 (++)

Substance misuse services

Five studies (Manning et al. 2002; Rao et al. 2007/Trathen et al. 2007; Virgo et al. 2001; Weaver et al. 2001b; Weaver et al. 2003/2004) reported prevalence data for severe mental illness diagnoses amongst individuals with substance misuse problems who were in contact with community drug or alcohol addiction services. See Table 5 for summary study characteristics of included studies that sampled from substance misuse settings and Appendix 11 for full evidence tables.

Manning et al. (2002), a cohort (-) study, found that 34% (17/50) of substance misuse clients screened positive for psychosis (Bebbington Psychosis Questionnaire; Bebbington & Nayani, 1995). While, 3 cohort [++] studies and 1 case-control [-] study estimated prevalence of a diagnosis of severe mental illness amongst addiction service caseloads ranging from 5.7% to 38.8% (Rao et al. 2007/Trathen et al. 2007; Virgo et al. 2001; Weaver et al. 2001b; Weaver et al. 2003/2004).

Table 5: Study characteristics of included studies in substance misuse settings

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Manning et al. 2002 Cohort (-) N: 50	NR (for subsample)	NR (for subsample)	NR (for subsample)	London (south)	Urban	First 50 clients screened who were attending substance misuse agencies (statutory drug services and a voluntary alcohol advisory service).	34	Clinical staff used a five-item screen for psychosis (PSQ)	NR (based on being treated in alcohol and drug services); Current
Rao et al. 2007/ Trathen et al. 2007 Case-control (-) N: 1808	16-64 (mean NR for whole sample)	NR (for whole sample)	NR (for whole sample)	Harlow and surrounding area of South East England	Semi-rural	All inpatients (5%), all CMHT patients (50%), all patients from the drug and alcohol service (13%), and a random sample of psychiatric outpatients (32%)	61.2 (total sample); 21.7 (CMHT); 24 (addiction service)	Diagnosis of psychotic disorder based on the working diagnosis made by the appropriate multidisciplinary team (including schizophrenia, bipolar affective disorder and severe depression) or any mental disorder if it was associated with a high risk of self-harm or violence	Substance use disorder (no further detail reported); Current
Virgo et al. 2001 Cohort (++) N: 1021	NR (for whole sample)	NR (for whole sample)	NR (for whole sample)	Dorset (eastern)	Mixed	All persons who were patients on a specific day (15.01.97) at an acute hospital (10%), residential and day treatment and rehabilitation units (19%), group therapy treatment unit	55 (total sample); 11.7 (CMHTs); 12.1 (addiction services)	Diagnosis of SMI (from case notes)	Keyworker ratings of substance misuse (using Clinician Rating Scales for alcohol and other drugs); 6 months

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
						(8%), addictions service including community drug and alcohol teams, a detoxification ward and an abstinence-oriented day treatment unit (31%) and a random sample of patients at CMHTs (33%)			
Weaver et al. 2001b Cohort (++) N: 1298	17-86 (mean NR; median: 38-45)	42	70	London (Hammersmith & Fulham)	Urban	Caseloads of CMHTs and substance misuse services	24.4 (CMHTs); 5.7 (addiction services)	ICD-10 diagnosis of non-substance-induced psychotic disorders (including schizophrenia, manic depression, bipolar affective disorder) (from case notes)	Keyworker-reported drug and/or alcohol consumption that met DSM-IV criteria for misuse of drug and/or alcohol; Current
Weaver et al. 2003/2004 [COSMIC study] Cohort (++) N: 560	18-68 (mean NR; median: 32-43)	39	81	London (Brent, and Hammersmith & Fulham), Nottingham and Sheffield	Urban	Caseloads of CMHTs and substance misuse services	41.4 (total sample); 44.0 (CMHTs); 38.9 (addiction services)	Participants in substance misuse services assessed for psychosis using the OPCRIT based on a case note review. Service-defined diagnoses were used to identify CMHT patients with psychosis	Harmful alcohol-related problems assessed using AUDIT (score≥8). A structured interview checklist identified drug types used and whether associated problems were present (economic, domestic, social, legal or interpersonal). Problem drug use defined as self-reported presence of one or more of the above drug-related

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
									problems or care coordinator assessment of misuse. The SDS assessed drug dependency. To assess the reliability of self-reported drug use in CMHT patients, a random subsample of participants also had hair and urine samples tested using chromatography and mass spectrometry analysis; Current; 1 year

Notes: NR = not reported. See glossary for other abbreviations and further details on scales (where available)

Quality rating: ++ (All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter); + (Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter); - (Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter)

Sub-analysis for prevalence in substance misuse services

If data were combined across studies the prevalence rate was 45.8% (1291/2817; see Table 6), although given the considerable heterogeneity of studies this estimate should be interpreted with caution.

Explorative narrative sub-analyses were performed:

- Sub-analysis by geographical location:
  - Higher prevalence in semi-rural or suburban settings (60.5%) (2 studies [Manning et al. 2002; Rao et al. 2007/Trathen et al. 2007]; N=1858)
  - than in urban locations (20.0%) (2 studies [Weaver et al. 2001b ; Weaver et al. 2003/2004]; N=646).
- Sub-analysis by year of data collection:
  - Higher prevalence post-2000 (58.2%) (2 studies [Rao et al. 2007/Trathen et al. 2007; Weaver et al. 2003/2004]; N=2086)
  - than pre-2000 (12.1%) (1 study [Virgo et al. 2001]; N=313).
- Sub-analysis by method of assessment of SMI:
  - No significant differences with a prevalence rate of 20.0% for documented diagnosis in case notes (2 studies [Weaver et al. 2001b; Weaver et al. 2003/2004]; N=646)
  - relative to 15.2% for staff ratings (2 studies [Manning et al. 2002; Virgo et al. 2001]; N=363).

The small number of studies included in these sub-analyses means that differences might be accounted for by peculiarities of individual studies, and thus more data is required before any conclusions could be drawn about the contributors to differing prevalence estimates.

Table 6: Sub-analysis for prevalence estimates of severe mental illness diagnoses amongst individuals with substance misuse problems who were in contact with community drug or alcohol addiction services

Study ID	Geographical location	Method of assessment of SMI	Years of data collection	Count	N
Manning et al. 2002	Suburban	Staff ratings	NR	17	50
Rao et al. 2007/Trathen et al. 2007	Semi-rural	NR	Post-2000	1107	1808
Virgo et al. 2001	Mixed	Staff ratings	Pre-2000	38	313
Weaver et al. 2001b	Urban	Documented diagnosis in case notes	NR	21	368
Weaver et al. 2003/2004	Urban	Documented diagnosis in case notes	Post-2000	108	278
Combined studies				1291	2817

Evidence Statement 1.1.3: Prevalence in substance misuse services

There is moderate evidence from 4 cohort studies (3 [++][3-5] and 1 [-][1]) and 1 case-

control study [-][2] about the prevalence of dual diagnosis amongst those in contact with substance misuse services. This evidence is mixed with estimates ranging from 5.7% to 38.8% for the prevalence of severe mental illness amongst individuals with substance misuse problems who are in contact with community drug or alcohol addiction services. If data are combined across studies the prevalence rate is 45.8%, although given the considerable heterogeneity of studies this estimate should be interpreted with caution. Differences in prevalence estimates could not be accounted for by method of assessment of severe mental illness (3 [++][3-5] and 1 [-][1]). Other sub-analyses were indicative of some differences as follows (however, the small number of studies included in these sub-analyses mean that differences might be accounted for by peculiarities of individual studies):

- Geographical location: Higher prevalence in semi-rural or suburban settings (2[-][1,2]) than in urban locations (2 [++][4,5]) with estimates of 60.5% and 20.0% respectively.
- Year of data collection: Higher prevalence post-2000 (1 [++][5] and 1 [-][2]) than pre-2000 [++][3] with estimates of 58.2% and 12.1% respectively.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence rates were estimated for individuals in contact with drug or alcohol addiction services and, given that patients with a dual diagnosis may be at higher risk of disengagement from services, prevalence rates may be underestimated.

[1]Manning et al. 2002 (-)
[2]Rao et al. 2007/Trathen et al. 2007 (-)
[3]Virgo et al. 2001 (++)
[4]Weaver et al. 2001b (++)
[5]Weaver et al. 2003/2004 (++)

Secondary mental health and addiction service settings

Three studies (Graham et al. 2001/ Graham & Maslin 2002 [1 study reported across 2 papers]; Virgo et al. 2001; Weaver et al. 2003/2004) reported prevalence data for dual diagnosis across secondary mental health and substance misuse service settings. See Table 7 for summary study characteristics of included studies that sampled across secondary mental health and substance misuse settings and Appendix 11 for full evidence tables.

Estimates of prevalence from 3 cohort (2 [++] and 1[+]) studies for dual diagnosis in community-based substance misuse and mental health service caseloads ranged from 8.8% to 41.4% (Graham et al. 2001/ Graham & Maslin 2002; Virgo et al. 2001; Weaver et al. 2003/2004).

Table 7: Study characteristics of included studies sampled across secondary mental health and substance misuse service settings

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Graham et al. 2001/ Graham & Maslin 2002 Cohort (+) N: 3682	18-69 (mean NR; Median: 34-37)	21	48	Birmingham	Urban	Caseloads of community-based substance misuse and mental health services	8.8; 23.7 (SMI)	Diagnosis of SMI (from case notes and official CPA documentation) or if no diagnosis had been made, their primary presenting mental health problem, classified according to ICD–10 criteria	Keyworker-rated substance abuse/dependence (based on AUS and DUS); 1 year
Virgo et al. 2001 Cohort (++) N: 1021	NR (for whole sample)	NR (for whole sample)	NR (for whole sample)	Dorset (eastern)	Mixed	All persons who were patients on a specific day (15.01.97) at an acute hospital (10%), residential and day treatment and rehabilitation units (19%), group therapy treatment unit (8%), addictions service including community drug and alcohol teams, a detoxification ward and an abstinence-oriented day treatment unit (31%) and a random sample of patients at CMHTs (33%)	55 (total sample); 11.7 (CMHTs); 12.1 (addiction services)	Diagnosis of SMI (from case notes)	Keyworker ratings of substance misuse (using Clinician Rating Scales for alcohol and other drugs); 6 months
Weaver et al. 2003/2004 [COSMIC study] Cohort (++) N: 560	18-68 (mean NR; median: 32-43)	39	81	London (Brent, and Hammersmith & Fulham), Nottingham and Sheffield	Urban	Caseloads of CMHTs and substance misuse services	41.4 (total sample); 44.0 (CMHTs); 38.9 (addiction services)	Participants in substance misuse services assessed for psychosis using the OPCRIT based on a case note review. Service-defined diagnoses were used to identify CMHT patients with psychosis	Harmful alcohol-related problems assessed using AUDIT (score≥8). A structured interview checklist identified drug types used and whether associated problems were present (economic, domestic, social, legal or interpersonal). Problem drug use defined as self-reported presence of one or more of the above drug-related problems or care coordinator assessment of misuse. The SDS assessed drug dependency. To assess the reliability of self-reported drug use in CMHT patients, a random subsample of participants also

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
									had hair and urine samples tested using chromatography and mass spectrometry analysis; Current; 1 year

Notes: NR = not reported. See glossary for other abbreviations and further details on scales (where available)

Quality rating: ++ (All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter); + (Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter); - (Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter)

Primary care

Prevalence of dual diagnosis

Frisher and Akram (2001)/Frisher et al. (2004)/(2005a) analysed a large General Practice Research Database (GPRD) in a cohort study (+) and found that the prevalence of dual diagnosis (ICD-9 diagnosis of schizophrenia or psychoses and abuse or dependence of illicit or prescription drugs) was 0.02% (126/527185) in primary care. This study also calculated the proportion of schizophrenia and psychoses in the general population that is potentially explained by exposure to substance misuse as 0.11 [0.01, 0.21] and the proportion of substance misuse in the general population that is potentially explained by exposure to schizophrenia and psychoses as 0.76 [0.47, 1.05].

Incidence of dual diagnosis

Only 1 case-control (++) study reported on the incidence of dual diagnosis. Frisher et al. (2013) used the GPRD to compare the incidence of a diagnosis of psychosis in cases with a drug misuse/dependence diagnosis compared to controls with no drug misuse/dependence history and found no evidence for a statistically significant difference (6/592 versus 0/592; OR 13.13 [0.74, 233.65]; p=0.08).

See Table 8 for summary study characteristics of included studies that sampled from primary care settings and Appendix 11 for full evidence tables.

Evidence Statement 1.1.4: Prevalence and incidence in primary care

There is moderate evidence from 1 cohort [+][1] study that estimates prevalence of dual diagnosis as 0.02% amongst individuals in contact with primary care.

There is strong evidence from 1 case-control [++][2] study for no difference in the incidence of a diagnosis of psychosis in cases with a drug misuse/dependence diagnosis compared to controls with no drug misuse/dependence history (OR 13.13 [0.74, 233.65]; p=0.08).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, prevalence estimates depend on recorded diagnosis by general practitioners and so may underestimate comorbidity in the community as it is tacit knowledge from the field that much substance misuse is not brought to the attention of GPs (tends to be limited to more severe problems and substance dependence) and much mental illness goes undetected by the healthcare services.

[1]Frisher & Akram 2001/Frisher et al. 2004/2005a (+)
[2]Frisher et al. 2013 (++)

Table 8: Study characteristics of included studies in primary care setting

Study [study name or abbreviation if applicable]; Study design (quality); N	Age (years)	Gender (% female)	Ethnicity (% white)	Geographical region	Geographical location	Sampling frame	% dual diagnosis	SMI method of assessment	Substance misuse method of assessment; timescale
Frisher & Akram 2001/ Frisher et al. 2004/2005a [GPRD] Cohort (+) N: 527,185	NR	NR	NR	England and Wales	NR	Secondary analysis of the GPRD	0.02	ICD-9 diagnosis of schizophrenia or psychoses from GPRD	ICD-9 diagnosis of non-dependent abuse of illicit drugs or dependence on or addiction to illicit drugs and a third category which is not covered by ICD-9, namely abuse of (prescription) licensed psychoactive medicines (e.g. benzodiazepines) from GPRD; 4 years
Frisher et al. 2013 [GPRD] Case-control (++) N: 1184	Range NR (mean: 29)	NR	NR	England, Scotland, Wales and Northern Ireland	Mixed	Secondary analysis of the GPRD	NR	Diagnosis of psychosis (from case notes)	Drug misuse/dependence events were taken from diagnostic and treatment (i.e. prescription) events; timescale NR

Notes: NR = not reported. See glossary for other abbreviations and further details on scales (where available)

Quality rating: ++ (All or most of the checklist criteria have been fulfilled, and where they have not been fulfilled the conclusions are very unlikely to alter); + (Some of the checklist criteria have been fulfilled, and where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter); - (Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter)

Characteristics of dual diagnosis populations

Severe mental illness

The severe mental illness most commonly reported as comorbid with substance misuse in populations recruited predominantly from secondary mental health services was schizophrenia, with estimates ranging from 35.9% to 92.3% of the dual diagnosis participants (Afuwape et al. 2006 [+]; Graham et al. 2001/ Graham & Maslin 2002 [+]; Leeson et al. 2012 [+]; Miles et al. 2003 [-]; Rowlands 2001 [-]; Virgo et al. 2001 [++]), followed by bipolar disorder which was the diagnosis made in 10.3% to 13% of dual diagnosis cases (Afuwape et al. 2006; Miles et al. 2003; Virgo et al. 2001). Substance-induced psychosis was also reported with estimates of 37.5% and 48.7% (Commander & Odell 2001 [+]; Rowlands 2001). However, this was an exclusion criterion in some studies.

In substance misuse services, severe depression was reported as the most prevalent severe mental illness diagnosis with estimate of 73.1% relative to schizophrenia and bipolar disorder which were the diagnoses in 7.4% and 3.7% of dual diagnosis cases respectively (Weaver et al. 2003/2004 [++]).

Substance misuse

The most commonly reported substances that were misused by people with severe mental illness and substance misuse problems were alcohol and cannabis, with 50.6-84.6% and 29.0-78.5% of the dual diagnosis populations misusing alcohol and cannabis respectively (Afuwape et al. 2006 [+]; Barnett et al. 2007; Commander & Odell 2001 [+]; Donoghue et al. 2011 [-]; Graham et al. 2001/ Graham & Maslin 2002 [+]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]; Schulte & Holland 2008 [-]; Turkington et al. 2009 [++]; Virgo et al. 2001 [++]; Weaver et al. 2001a [++]; Weaver et al. 2001b [++]; Weaver et al. 2003/2004 [++]; Wright et al. 2000/2002 [++]) and 80.1% and 35.6-90.9% using alcohol and cannabis respectively (Afuwape et al. 2006; Duke et al. 2001 [-]; Hipwell et al. 2000 [-]; Weaver et al. 2003/2004). The percentage of the dual diagnosis samples reporting problems with other substances were 6.0-20.8% for stimulants (Commander & Odell 2001; Priebe et al. 2003/Fakhoury & Priebe 2006), 9.7-23.8% for cocaine/crack (Afuwape et al. 2006; Graham et al. 2001/ Graham & Maslin 2002; Priebe et al. 2003/Fakhoury & Priebe 2006; Weaver et al. 2003/2004), 10.5-12% for amphetamines (Graham et al. 2001/ Graham & Maslin 2002; Virgo et al. 2001), 4.2-10% for opiates (Graham et al. 2001/ Graham & Maslin 2002; Priebe et al. 2003/Fakhoury & Priebe 2006; Virgo et al. 2001).

Age variation

Turkington et al. (2009) [++] compared cases with psychosis generally or schizophrenia specifically and comorbid substance misuse to controls with psychosis or schizophrenia who had never misused substances and found significant differences between groups, with substance misuse comorbidity associated with a younger mean age at presentation for individuals with psychosis (mean: 30.70 years [sd=10.90; N=83] versus 36.9 years [sd=12.6; N=105]; MD -6.20 [-9.57, -2.84];

p=0.0003)) or schizophrenia (mean 27.25 years [sd=8.59; N=53] versus 36 years [sd=13.7; N=50]; MD -8.75 [-13.20, -4.31]; p=0.0001).

Weaver et al. (2001) [++] compared the numbers of participants with severe mental illness and substance misuse to those with severe mental illness without substance misuse for different age groups and found a higher number of dual diagnosis participants in the 16-30 year age group (43/208 [21%] versus 83/643 [13%]; OR 1.76 [1.17, 2.64]; p=0.007), the 31-40 year age group (73/208 [35%] versus 164/643 [26%]; OR 1.58 [1.13, 2.21]; p=0.008) and the 41-50 year age group (64/208 [31%] versus 139/643 [22%]; OR 1.61 [1.14, 2.29]; p=0.007) and a lower number of those with dual diagnosis in the 51 years and over age group (28/208 [13%] versus 257/643 [40%]; OR 0.23 [0.15, 0.36]; p<0.00001).

A meta-analysis of 2 studies (N=242; Donoghue et al. 2014 [++]; Leeson et al. 2012 [+]) found that cases with dual diagnosis showed a significantly younger age of onset of first psychotic symptoms than severe mental illness-only controls (MD -3.97 [-6.03, -1.91]; p=0.0002; I^2=0%). A further meta-analysis of 2 studies (N=175; Donoghue et al. 2014; Hipwell et al. 2000 [-]) found that individuals with coexisting severe mental illness and substance misuse problems were significantly younger at their first contact with mental health services (MD -3.60 [-5.95, -1.26]; p=0.003; I^2=0%) than individuals with severe mental illness and no recorded substance misuse (see Appendix 10, forest plot 2.1 and 2.2).

Ethnic variation

Afuwape et al. (2006) [+] compared the rates of dual diagnosis prevalence in Black Caribbean, Black African, Black British and White groups who were on a CMHT caseload. However, to avoid multiple comparisons (without statistical correction) and given that the comparator White group did not differentiate by country of origin, the review team combined across Black Caribbean, Black African, and Black British groups to form a composite Black group which was then compared against a White group. This comparison revealed statistically significant ethnic differences, with a lower prevalence of dual diagnosis in the White group than in the Black group (118/894 [13%] versus 95/538 [18%]; OR 0.71 [0.53, 0.95]; p=0.02)). There was also a lower rate of cannabis abuse in the White relative to the Black dual diagnosis participants (42/118 [36%] versus 73/95 [77%]; OR 0.17 [0.09, 0.31]; p<0.00001). However, this pattern was reversed for alcohol, with higher rates of alcohol abuse in the White group (101/118 [86%] versus 52/95 [55%]; OR 4.91 [2.56, 9.44]; p<0.00001)), higher mean monthly consumption of alcohol in units (mean 243 [sd= 488; N=87] versus 77 [sd=130; N=59]; MD 165.69 [57.92, 273.47], p=0.003) and a higher mean score on the AUDIT (mean 15 [sd=11; N=87] versus 8 [sd=7; N=59]; MD 6.97 [3.98, 9.95], p<0.00001) misuse.

However, Donoghue et al. (2014) [++] found evidence for a contradictory pattern for cannabis use, with a higher number of white participants observed in the group with schizophrenia and lifetime cannabis use relative to those with schizophrenia and no record of cannabis use (42/85 [49%] versus 17/58 [29%]; OR 2.36 [1.16, 4.78], p=0.02).

A meta-analysis with 2 studies (N=891; Weaver et al. 2001a [++]; Wright et al. 2000/2002 [++]) compared the number of white participants in dual diagnosis relative to severe mental illness-only groups and found no evidence for any statistically significant ethnic variation (130/221 [59%] versus 361/670 [54%]; OR 1.23 [0.90, 1.68], p=0.19; I^2=0%) (see Appendix 10, forest plot 3.1).

Gender variation

A meta-analysis of 6 studies (N=1776; Donoghue et al. 2014 [++]; Leeson et al. 2012 [+]; Turkington et al. 2009 [++]; Virgo et al. 2001 [++]; Weaver et al. 2001a [++]; Wright et al. 2000/2002 [++]) comparing the number of females in dual diagnosis relative to severe mental illness-only groups found evidence for a lower proportion of females in the group with comorbid severe mental illness and substance misuse (154/539 [29%] versus 622/1237 [50%]; OR 0.40 [0.32, 0.51], p<0.00001; I^2=0%) (see Appendix 10, forest plot 4.1).

Geographical variation

Weaver et al. (2003/2004) [++] was the only study to compare dual diagnosis prevalence and characteristics in 2 urban areas in different geographical locations, and found a higher prevalence of dual diagnosis in London CMHTs relative to Nottingham and Sheffield CMHTs (61/114 [54%] versus 63/168 [38%]; OR 1.92 [1.18, 3.11], p=0.008). There were also significantly higher rates in London for the sub-categories of problem drug use (48/61 [79%] versus 36/63 [57%]; OR 2.77 [1.26, 6.10], p=0.01), use of cannabis (41/61 [67%] versus 30/63 [48%]; OR 2.25 [1.09, 4.67], p=0.03) and use of sedatives/tranquillisers (19/61 [31%] versus 2/63 [3%]; OR 13.80 [3.05, 62.40], p=0.0007).

Evidence Statement 1.1.5: Characteristics of the dual diagnosis population

There is moderate to strong evidence from 11 cohort studies and 7 case-control studies on the characteristics of the dual diagnosis population.

Severe mental illness

There is moderate evidence from 3 case-control (2 [+][3,8] and 1 [-][9]) and 3 cohort (1 [++][15], 1 [+][1] and 1 [-][11]) studies about the proportion of the dual diagnosis population in secondary mental health services with different severe mental illness diagnoses. The evidence is mixed as regards to the point estimates, however, the pattern is consistent across studies. The severe mental illness most commonly reported as comorbid with substance misuse was schizophrenia, with estimates ranging from 35.9% to 92.3% of the dual diagnosis participants[1,8,9,11,15], followed by bipolar disorder which was the diagnosis made in 10.3% to 13% of dual diagnosis cases[1,10,16]. Substance-induced psychosis was also reported with estimates of 37.5%[3] and 48.7%[11], however, this was an exclusion criteria in some studies.

There is strong evidence from 1 cohort [++][17] study about the proportion of the dual diagnosis population in substance misuse services with different severe mental illness diagnoses. The severe mental illness most commonly comorbid with substance misuse amongst adults in contact with addiction services was severe depression with an estimate of 73.1% relative to schizophrenia and bipolar disorder which were the diagnoses in 7.4% and 3.7% of dual diagnosis cases respectively[18].

Substance misused

There is moderate evidence from 11 cohort (4 [++][10,15,16,17], 3 [+][1,2,6] and 4 [-][4,11,12,14]) and 2 case-control (1 [+][3] and 1 [-][9]) studies about the proportion of the dual diagnosis population in secondary mental health and substance misuse services misusing different substances. The evidence is mixed as regards to the point estimates, however, the pattern is consistent across studies and services. The most commonly reported substances that were misused by people with severe mental illness and substance misuse problems were alcohol and cannabis, with 50.6-84.6% and 29.0-78.5% of the dual diagnosis populations misusing alcohol and cannabis respectively[1-4,6,10,12,13,15-18]. The percentage of the dual diagnosis samples reporting problems with other substances were: 9.7-23.8% for cocaine or crack[1,6,10,17], 6.0-20.8% for stimulants[3,10]; 10.5-12% for amphetamines[6,15]; 0.9-10% for opiates[3,6,10,15].

Age variation

There is moderate evidence from 3 case-control studies (1 [++][5], 1 [+][8] and 1[-][7]) that dual diagnosis is associated with younger age (relative to severe mental illness-only). A meta-analysis of 2 studies (1 [++][5] and 1 [+][8]) found a significantly younger age of onset of first psychotic symptoms (MD -3.97 [-6.03, -1.91]; p=0.0002; I^2=0%), and a meta-analysis of 2 studies (1 [++][5] and 1[-][7]) found a

significantly younger age at first contact with mental health services (MD -3.60 [-5.95, -1.26]; p=0.003; I^2=0%), amongst cases with dual diagnosis relative to severe mental illness-only controls.

Gender variation

There is strong evidence from 4 case-control (3 [++][5,13,18] and 1 [+][8]) and 2 cohort (2 [++][15,16]) studies for a preponderance of males in a dual diagnosis group relative to a group with severe mental illness-only. A meta-analysis of these 6 studies found evidence for a lower proportion of females in the group with comorbid severe mental illness and substance misuse (OR 0.40 [0.32, 0.51], p<0.00001; I^2=0%).

Ethnic variation

There is strong evidence from 2 case-control (2 [++][5,18]) and 2 cohort (1 [++][16] and 1 [+][1]) studies about ethnic variation in rates of dual diagnosis or between cases with severe mental illness and comorbid substance misuse and controls with severe mental illness and no recorded substance misuse. However, the evidence about the direction of this variation is mixed. One study [+][1] found a lower prevalence of dual diagnosis (OR 0.71 [0.53, 0.95]; p=0.02) and a lower rate of cannabis abuse (OR 0.17 [0.09, 0.31]; p<0.00001) in white relative to black dual diagnosis participants, and the reverse pattern for alcohol with higher rates of alcohol abuse (OR 4.91 [2.56, 9.44]; p<0.00001), higher mean monthly consumption of alcohol in units (MD 165.69 [57.92, 273.47], p=0.003) and a higher mean score on the AUDIT (MD 6.97 [3.98, 9.95], p<0.00001) in the white group. However, another study [++][5] found evidence for a contradictory pattern for cannabis use, with a higher number of white participants observed in the group with schizophrenia and lifetime cannabis use relative to those with schizophrenia and no record of cannabis use (OR 2.36 [1.16, 4.78], p=0.02). Finally, a meta-analysis with 2 studies [++][16,18] compared the number of white participants in dual diagnosis relative to severe mental illness-only groups and found no evidence for any statistically significant ethnic variation (OR 1.23 [0.90,1.68]; p=0.19; I^2=0%).

With the exception of age, gender and ethnicity, no evidence was found from English-language studies published from 2000 for any variation in other groups which were identified as being of interest, for example: people with a learning disability; teenage parents; travellers; asylum seekers or refugees; lesbian, gay, bisexual, transsexual or transgender people; sex workers.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]Afuwape et al. 2006 (+)
[2]Barnett et al. 2007 (+)
[3]Commander & Odell 2001 (+)
[4]Donoghue et al. 2011 (-)

[5]Donoghue et al. 2014 (++)
[6]Graham et al. 2001/ Graham & Maslin 2002 (+)
[7]Hipwell et al. 2000 (-)
[8]Leeson et al. 2012 (+)
[9]Miles et al. 2003 (-)
[10]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[11]Rowlands 2001 (-)
[12]Schulte & Holland 2008 (-)
[13]Turkington et al. 2009 (++)
[14]Verdolini et al. 2014 (-)
[15]Virgo et al. 2001 (++)
[16]Weaver et al. 2001a and Weaver et al. 2001b (duplicate data) (++)
[17]Weaver et al. 2003/2004 (++)
[18]Wright et al. 2000/2002 (++)

Relationship between severe mental illness and substance misuse

McManus et al. (2009) [+] investigated the correlation between psychotic disorder and alcohol dependence or drug dependence in a large comprehensive catchment area survey (*Adult in Psychiatric Morbidity in England, 2007: Results of a Household Survey*) and found that the tetrachoric correlation between psychotic disorder (ICD-10 assessed using SCAN; past year) and alcohol dependence (screen positive on AUDIT and SADQ-C; past 6 months) was 0.25 and the correlation between psychotic disorder and drug dependence (screen positive based on Diagnostic Interview Schedule; past year) was 0.4. Both of these correlations fall below what would generally be considered as a strong correlation between 2 variables using a rule-of-thumb of a correlation≥0.5. However, whilst the correlation between psychosis and alcohol dependence was small, the correlation between psychosis and drug dependence may show a trend for significance given that correlations of 0.3-0.5 may indicate a correlation that is weaker but of interest.

Wiles et al. (2006) [+] performed secondary analyses on data from the previous Psychiatric Morbidity Survey (Singleton et al. 2001) and found that harmful drinking (AUDIT score≥16) and dependence on cannabis both increased the risk of incident psychotic symptoms at follow-up (OR 3.31 [1.52, 7.22] and OR 3.40 [1.50, 7.73] respectively).

Tyler et al. (2015) [-] examined the relationship between bipolar disorder and cannabis use in daily life using an Experience Sampling Methodology (ESM) where participants wore a digital wristwatch that emitted a beep throughout the day at unpredictable times, and participants were required to complete a diary concerning bipolar symptoms and cannabis use at each of these beeps. Counterintuitively, this study found that higher levels of positive affect (including emotions such as happy, satisfied and relaxed) increased the odds of cannabis use (OR: 1.25 [1.06, 1.47]; p = 0.008) and cannabis use was associated with subsequent increases in positive affect (β = 0.35 [0.20, 0.51]; p = 0.000). However, cannabis use was also associated with subsequent increases in manic symptoms (β = 0.20 [0.05, 0.34]; p = 0.009) and depressive symptoms (β = 0.17 [0.04, 0.29]; p = 0.008).

Evidence statement 1.1.6: Relationship between severe mental illness and substance misuse

There is weak evidence from 3 cohort studies on the relationship between severe mental illness and substance misuse.

There is weak evidence from 1 cohort study [+][1] of a small, non significant correlation between psychotic disorder and alcohol dependence (tetrachoric correlation=0.25) and between psychotic disorder and drug dependence, which showed a trend for significance (tetrachoric correlation=0.4), in a large comprehensive catchment area.

There is weak evidence from 1 cohort study [+][3] that harmful drinking and dependence on cannabis may increase the risk of incident psychotic symptoms at

follow-up (OR 3.31 [1.52, 7.22] and OR 3.40 [1.50, 7.73] respectively).

There is weak evidence from 1 cohort study [-][2] suggesting that cannabis use is associated with subsequent increases in manic symptoms (β = 0.20 [0.05, 0.34]; p = 0.009) and depressive symptoms (β = 0.17 [0.04, 0.29]; p = 0.008) in people with bipolar disorder who also use cannabis. Conversely, this study also suggested that higher levels of positive affect increase the odds of cannabis use (OR: 1.25 [1.06, 1.47]; p = 0.008) and that cannabis use is associated with subsequent increases in positive affect (β = 0.35 [0.20, 0.51]; p = 0.000).

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]McManus et al. (2009) (+)
[2]Tyler et al. (2015) (-)
[3]Wiles et al. (2006) (+)

Prevalence of health and social care needs

Afuwape et al. (2006) and Miles et al. (2003) reported the mean number of met and unmet needs combined, and unmet needs respectively as 3.4 (sd=4.2) and 5.6 (sd=3.0) per dual diagnosis participant, assessed using the Camberwell Assessment of Needs Short Assessment Schedule (CANSAS). The CANSAS assesses current needs (met and unmet) in 22 social and clinical areas (including housing, money, physical health and social care) and is scored from 0-44 with higher scores indicating greater need.

Cantwell (2003) and Weaver et al. (2003/2004) also used the CANSAS but compared scores between disorder and no-disorder groups. Cantwell (2003) [++] compared participants with schizophrenia and current problem substance use (ICD-10 harmful drug and/or alcohol use or dependence in the past year) with participants with schizophrenia and no substance use problem and found a significantly higher level of (met and unmet) need in the dual diagnosis group (mean 6.3 [sd=4.4; N=64] versus 4.2 [sd=3.4; N=252]; MD 2.10 [0.94, 3.26], p=0.0004). Weaver et al. (2003/2004) [++] made the alternative comparison of drug and alcohol service patients with comorbid psychotic disorder versus drug and alcohol service patients with no comorbid psychiatric disorder, and found significant group differences (excluding mental health items) in the number of needs (range 0-20; mean 7.3 [sd=3.5; N=29] versus 2.2 [sd=1.4; N=64]; MD 5.10 [3.78, 6.42]; p<0.000001), severity of need score (range 0-40; mean 10.7 [sd=6; N=29] versus 2.9 [sd=2.2; N=64; MD 7.80 [5.55, 10.05]; p<0.00001), number of unmet needs (range 0-20; mean 3.7 [sd=2.3; N=29] versus 1 [sd=1.2; N=64]; MD 2.70 [1.81, 3.59]; p<0.00001), but also the number of met needs (range 0-20; mean 4.2 [sd=3; N=29] versus 1.5 [sd=1.2; N=64; MD 2.70 [1.57, 3.83], p<0.00001).

Evidence Statement 1.1.7: Prevalence of health and social care needs in dual diagnosis

There is moderate evidence from 2 cohort studies on the prevalence of health and social care needs of people with a dual diagnosis.

There is moderate evidence from 1 cohort study [++][1] suggesting that people with schizophrenia and substance use have a significantly higher level of met and unmet needs than people with schizophrenia only (mean 6.3 [sd=4.4; N=64] versus 4.2 [sd=3.4; N=252]; MD 2.10 [0.94, 3.26], p=0.0004).

There is moderate evidence from 1 cohort study [++][2] suggesting that people from a drug and alcohol service who also had a psychotic disorder have a higher number of needs (range 0-20; mean 7.3 [sd=3.5; N=29] versus 2.2 [sd=1.4; N=64]; MD 5.10 [3.78, 6.42]; p<0.000001), a higher severity of needs (range 0-40; mean 10.7 [sd=6; N=29] versus 2.9 [sd=2.2; N=64; MD 7.80 [5.55, 10.05]; p<0.00001), a higher number of unmet needs (range 0-20; mean 3.7 [sd=2.3; N=29] versus 1 [sd=1.2; N=64]; MD 2.70 [1.81, 3.59]; p<0.00001), but also a higher number of met needs (range 0-20; mean 4.2 [sd=3; N=29] versus 1.5 [sd=1.2; N=64; MD 2.70 [1.57, 3.83], p<0.00001), than people from the same drug and alcohol service who did not have a psychotic disorder.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK.

[1]Cantwell 2003 (++)
[2]Weaver et al. 2003/2004 (++)

Prevalence of health care needs

Symptom duration and severity

Turkington et al. (2009) [++] found no difference between cases with schizophrenia and substance misuse and controls with schizophrenia-only in a dichotomous measure of the duration of untreated psychosis, defined as over 6 months (29/53 versus 28/50; OR 0.95 [0.44, 2.07]; p=0.90). Donoghue et al. (2014) [++] also found no statistically significant difference between a group with schizophrenia/schizoaffective disorder and lifetime cannabis use compared to a group with schizophrenia/schizoaffective disorder and no lifetime cannabis use in the number of days from the onset of psychosis to first contact with mental health services for psychosis (median 86 days [IQR=31-238; N=85] versus 138 days [IQR=29-546; N=58]; U and p NR). Leeson et al. (2012) [+] also found no statistically significant difference in the duration of untreated psychosis in weeks (MD -10.47 [-42.71, -21.77], p=0.52) in dual diagnosis participants compared with severe mental illness-only participants (see Appendix 10, forest plot 5.1).

A number of studies compared measures of symptom severity between dual diagnosis and severe mental illness-only groups. Weaver et al. (2003/2004) [++] compared psychiatric symptom severity (assessed using the Comprehensive Psychopathological Rating Scale [CPRS]) between CMHT clients with substance misuse versus CMHT clients without substance misuse and found a statistically significant difference with more severe symptomatology observed in the dual diagnosis group (median 22 [range=0=75; N=124] versus 15.5 [range=0-65; N=158]; U = 5.8, p=0.001). Moreover, a meta-analysis of 3 studies (N= 600; Cantwell 2003 [++]; Leeson et al. 2012 [+]; Turkington et al. 2009 [++]) found evidence for a small but statistically significant effect on positive symptoms including delusions, hallucinations, hyperactivity, grandiosity, suspiciousness/persecution and hostility (as assessed using the Positive and Negative Symptom Scale [PANSS], Scale for the Assessment of Positive Symptoms [SAPS], or Scales for the Assessment of Positive and Negative Symptoms [Andreasen, 1990]), with greater severity in the group with comorbid substance misuse problems (SMD 0.20 [0.02, 0.38]; p=0.03; I^2=0%) (see Appendix 10, forest plot 6.1). The same 3 studies found no evidence for a statistically significant group difference in negative symptoms including blunted affect, emotional withdrawal, poor rapport, difficulty in abstract thinking, lack of spontaneity and stereotyped thinking (SMD -0.01 [-0.29, 0.26]; p=0.93;I^2=55%). However, it is important to note that there was moderate heterogeneity in the effect estimates across studies as indicated by an I^2 statistic of 55%, although the chi-squared test for heterogeneity was not statistically significant (Chi^2 = 4.41, df = 2, p = 0.11) (see Appendix 10, forest plot 6.2). Planned sensitivity analysis (excluding studies where data collection was carried out pre-2000) was not possible as the year/s of data collection were not reported in 2 of the 4 studies, in 1 study data was collected pre- and post-2000 and only 1 study conclusively involved data collection post-2000. A meta-analysis of 2 studies (N=643; Turkington et al. 2009; Virgo et al. 2001) found evidence for a higher probability of relapse or non-remission (symptomatic relapse following a period of remission or no remission of symptoms within first year estimated from case notes and Psychiatric and Personal History Schedule [PPHS] or number of participants who had experienced ≥1 crises leading to more treatment in the preceding 6 months) amongst individuals with severe mental illness and concurrent substance misuse problems (83/128 [65%] versus 205/515 [40%]; OR 2.86 [1.90, 4.31], p<0.00001; I^2=0%) (see Appendix 10, forest plot 6.3). One study (N=99; Leeson et al. 2012) also examined group differences in depression symptoms (measured using the Calgary Depression Scale [CDS] or Hamilton Rating Scale for Depression), but no significant difference was observed between people with severe mental illness and substance misuse problems and those with severe mental illness and no reported substance misuse problems (SMD -0.15 [-0.56, 0.27]; p=0.49) (see Appendix 10, forest plot 6.4).

Self-harm and suicide

Graham et al. (2001)/ Graham and Maslin (2002) [+] found that 27.8% (90/324) of their dual diagnosis sample (severe mental illness and past-year substance use with impairment or dependence) had experienced incidents of suicidal ideation or behaviour, or self-harm, over the past year as reported by their keyworker. Miles et al. (2003) examined the prevalence of self-harm within a dual diagnosis sample and found that 29.0% (62/214) had ever harmed themselves (rated by their case

manager based on the best available information from patients, staff and case notes). Miles et al. (2003) [-] also compared history of self-harm across substance-of-choice subgroups (alcohol only, alcohol and cannabis, cannabis only, stimulants), however, no statistically significant differences were observed (p=0.14-0.91). Finally, Priebe et al. (2003)/Fakhoury and Priebe (2006) [++] compared the number of participants who had committed acts of parasuicide in the last 2 years (from case note review) between dual diagnosis and severe mental illness-only groups and found no statistically significant difference between a group with severe mental illness and alcohol abuse/dependence relative to a group with severe mental illness and no alcohol use or use of alcohol without impairment (12/85 versus 38/437; OR 1.73 [0.86, 3.46]; p=0.12) and no statistically significant difference between a group with severe mental illness and drug abuse/dependence relative to a group with severe mental illness and no drug use or use of drugs without impairment (10/103 versus 38/416; OR 1.07 [0.51, 2.23]; p=0.86).

Medication adherence

Leeson et al. (2012) [-] compared medication adherence in a group with schizophrenia and lifetime cannabis use versus a group with schizophrenia who had never used cannabis and found a statistically significant difference, with a lower mean score on the Compliance Rating Scale (Hayward et al., 1995) for the group with a dual diagnosis (mean 4.8 [sd=1.7; N=65] versus 5.5 [sd=1.4; N=34]; MD -0.75 [-1.36, -0.14], p=0.02). Type of medication and how long the participants had been on medication was not reported in this study. Weaver et al. (2001a) examined a dichotomous measure of non-compliance with antipsychotic medication amongst a prescribed subgroup with severe mental illness and substance misuse relative to those with severe mental illness-only and found that the rate of non-compliance was over doubled for the dual diagnosis group (92/185 [50%] versus 126/590 [21%]; OR 3.64 [2.57, 5.16]; p<0.00001). Turkington et al. (2009) [++] compared the number of participants with poor medication adherence (lapses of 3 or more days more than once, or not taking any prescribed medication estimated from case notes and Psychiatric and Personal History Schedule [PPHS]) between individuals with first-episode psychosis who have never misused substances (‘never’ group), those who stop misusing substances after initial presentation (‘stopped’ group) and those who persistently misuse substances (‘persistent’ group). This study found a significantly higher rate of poor adherence in the persistent relative to never group (21/43 [49%] versus 18/105 [17%]; OR 4.61 [2.11, 10.11], p=0.0001) and in the persistent relative to stopped group (21/43 [49%] versus 10/40 [25%]; OR 2.86 [1.13, 7.28]; p=0.03), but no statistically significant difference between the stopped and never groups (OR 1.61 [0.67, 3.87]; p=0.29).

Met and unmet treatment needs

Weaver et al. (2001a) [++] and (2001b) [++] estimated that 48.1-52.0% of dual diagnosis clients in secondary mental health care settings have a current unmet need for substance misuse interventions as assessed by their caseworker. Weaver et al. (2001a and 2001b) found that 19.7-24.7% of dual diagnosis clients on a CMHT caseload were currently receiving substance misuse interventions, and Weaver et al. (2003/2004) found that 20.8% and 16.7% of CMHT clients with harmful alcohol or

drug use respectively had received alcohol-or drug-related interventions in the month prior to assessment. Weaver et al. (2003/2004) compared self-reported levels of need between CMHT clients with substance misuse and CMHT clients without substance misuse and found higher levels of need in the dual diagnosis group across all Camberwell Assessment of Need (CAN)-derived measures encompassing both met and unmet needs as follows: Number of needs (median 5 [range=0-15; N=124] versus 4 [range=0-12; N=158]; U = 7493.0, p=0.001); Severity of need score (median 7 [range=0-26; N=124] versus 5 [range=0-20; N=158]; U = 7309.0, p<0.001); Number of met needs (median 3 [range=0-13; N=124] versus 2 [range=0-10; N=158]; U=8285.5, p=0.03); Number of unmet needs (median 2 [range=0-9; N=124] versus 1.5 [range=0-9; N=158]; U = 7576.5, p=0.001).

Weaver et al. (2003/2004) [++] also examined met and unmet treatment needs amongst dual diagnosis clients of drug and alcohol services. In terms of contact with services, this study found that 96.6% of drug and alcohol service patients with psychosis were consulting any service specifically about mental health problems, 13.8% were consulting a GP specifically about mental health problems, 13.8% were consulting a drug service psychiatrist specifically about mental health problems, 24.1% were consulting a mental health service psychiatrist specifically about mental health problems and 44.8% were consulting a mental health service psychiatrist and had been allocated to a CMHT keyworker/care coordinator specifically about mental health problems. In terms of the number of drug and alcohol service patients with psychosis receiving interventions from specialist mental health services, 69.0% were receiving mental health assessment/monitoring/review, 31.0% counselling/psychotherapy, 31.0% care management (including day care) and 24.1% day care. This study also compared met and unmet needs between drug and alcohol service patients with comorbid psychotic disorder to drug and alcohol service patients with no comorbid psychiatric disorder and found the same pattern of results as observed in CMHT patients, namely a higher level of both met and unmet needs in the dual diagnosis group as follows: Number of needs (mean 7.3 [sd=3.5] versus 2.2 [sd=1.4]; MD 5.10 [3.78, 6.42]; p<0.00001); Severity of need (mean 10.7 [sd=6] versus 2.9 [sd=2.2]; MD 7.80 [5.55, 10.05]; p<0.00001); Number of met needs (mean 4.2 [sd=3] versus 1.5 [sd=1.2]; MD 2.70 [1.57, 3.83]; p<0.00001); Number of unmet needs (mean 3.7 [sd=2.3] versus 1 [sd=1.2]; MD 2.70 [1.81, 3.59]; p<0.00001).

Service utilisation

Miles et al. (2003) [-] found that 58.2% of their dual diagnosis participants had been admitted as an inpatient in the past 18 months, and the mean number of days admitted was 76.9 (sd=120.1). In addition, a meta-analysis of 2 studies (N=551; Hipwell et al. 2000 [-]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]) found a greater number of participants had been admitted as an inpatient over the past 1-2 years in a group with dual diagnosis compared to controls with severe mental illness-only (98/119 [82%] versus 294/432 [68%]; OR 2.78 [1.61, 4.81], p=0.0002; I^2=0%) (see Appendix 10, forest plot 7.1).

Evidence Statement 1.1.8: Prevalence of health care needs in dual diagnosis

There is moderate to strong evidence from 4 cohort studies and 5 case-control studies on the health care needs of people with a dual diagnosis. The evidence was generally consistent with moderate heterogeneity found in one outcome for symptom duration and severity.

Symptom duration and severity

There is strong evidence from 3 case-control studies (2[++][2,6] and 1[+][4]) about differences in the duration of the severe mental illness. No difference was found in between people with a dual diagnosis and those with schizophrenia only for the duration of untreated psychosis when measured dichotomously (29/53 versus 28/50; OR 0.95 [0.44, 2.07]; p=0.90)[6] or continuously (MD -10.47 [-42.71, -21.77], p=0.52)[4]. There was also no difference in the number of days from the onset of psychosis to first contact with mental health services for psychosis (median 86 days [IQR=31-238; N=85] versus 138 days [IQR=29-546; N=58]; U and p NR)[2] between those with schizophrenia and cannabis use compared with those with schizophrenia only.

There is strong evidence from 3 case-control studies (2 [++][1,6] and 1 [+][4]) and 1 cohort study [++][7] about differences in psychiatric symptom severity between people with a dual diagnosis and those with severe mental illness only. A meta-analysis of 2 studies[6,7] found a higher rate of relapse or non-remission amongst a dual diagnosis group (OR 2.86 [1.90, 4.31], p<0.00001; I^2=0%). In addition, a meta-analysis of 3 studies[1,4,6] found greater severity of positive symptoms in the dual diagnosis group (SMD 0.20 [0.02, 0.38]; p=0.03; I^2=0%). Moreover, these differences appear to be specific, as no evidence was found for a difference in negative symptoms[1,4,6] (SMD -0.01 [-0.29, 0.26]; p=0.93; I^2=55%) or symptoms of depression[4] (SMD -0.15 [-0.56, 0.27]; p=0.49) between people with a dual diagnosis and those with severe mental illness and no reported substance misuse problems.

Suicide

There is strong evidence from 1 cohort study [++][5] that there is no difference in the rates of attempted suicide in dual diagnosis relative to severe mental illness-only groups (OR 1.73 [0.86, 3.46], p=0.12 for alcohol abuse/dependence; OR 1.07 [0.51, 2.23], p=0.86 for drug abuse/dependence).

Medication adherence

There is strong evidence from 2 case-control studies (1 [++][6] and 1 [+][4]) and 1 cohort study [++][8] about differences in medication compliance between people with a dual diagnosis and those with severe mental illness-only. All 3 individual studies found significantly greater medication non-adherence associated with comorbid substance misuse in individuals with severe mental illness (p values: <0.00001 – 0.02).

Met and unmet needs

There is strong evidence from 1 cohort study [++][9] about differences in met and unmet treatment needs between individuals with severe mental illness with or without coexisting substance misuse. This study compared self-reported levels of need between CMHT clients with substance misuse and CMHT clients without substance misuse, and between drug and alcohol service patients with a co-existing psychotic disorder and drug and alcohol service patients with no co-existing psychiatric disorder, and found higher levels of need in the dual diagnosis groups across all Camberwell Assessment of Need (CAN)-derived measures encompassing both met and unmet needs (p values: <0.00001 – 0.03).

Service utilisation

There is moderate evidence from 1 case-control study [-][3] and 1 cohort study [++][5] about differences in service utilisation between dual diagnosis and severe mental illness-only groups. A meta-analysis of these 2 studies found a greater number of participants with a dual diagnosis had been admitted as an inpatient over the past 1-2 years compared with those with a severe mental illness only (OR 2.78 [1.61, 4.81], p=0.0002; I^2=0%).

Physical health care needs

No evidence was found from English-language studies published from 2000 for other health care needs that were identified as being of interest in a dual diagnosis population, for example, the prevalence of coexisting physical health problems.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, the majority of the data were obtained from individuals in contact with secondary mental health services and it is likely that the health care needs of this group will be a conservative estimate of the needs in the wider undetected or disengaged dual diagnosis population.

[1]Cantwell 2003 (++)
[2]Donoghue et al. 2014 (++)
[3]Hipwell et al. 2000 (-)
[4]Leeson et al. 2012 (+)
[5]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[6]Turkington et al. 2009 (++)
[7]Virgo et al. 2001 (++)
[8]Weaver et al. 2001a (++)
[9]Weaver et al. 2003/2004 (++)

Prevalence of social care needs

Education

Afuwape et al. (2006) [+] found that 57.0% of their dual diagnosis participants had no qualifications. However, a meta-analysis of 2 studies (N=173; Donoghue et al. 2014 [++]; Hipwell et al. 2000 [-]) found no statistically significant difference in the number of participants leaving school by age 16 or with no qualifications between those with severe mental illness and coexisting substance misuse and those with severe mental illness-only (OR 1.71 [0.41, 7.06]; p=0.46) (see Appendix 10, forest plot 8.1). However, heterogeneity was substantial with an I^2 value of 62%, and sensitivity analysis was not possible given that only 2 studies were included in the meta-analysis. Leeson et al. (2012) [+] also found no difference in mean years of education between cases with schizophrenia and lifetime cannabis use and controls with schizophrenia who had never used cannabis (MD -0.33 [-1.15, 0.49]; p=0.43).

Employment

Afuwape et al. (2006) [+] and Miles et al. (2003) [-] found that 89.7-90.5% of their dual diagnosis participants were unemployed. Miles et al. (2003) also compared the rate of unemployment across substance misuse groups (alcohol-only, alcohol and cannabis, cannabis-only and stimulants-only) and found no statistically significant differences (p=0.22-0.82). A meta-analysis of 3 studies (N=1117; Donoghue et al. 2014 [++]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]; Virgo et al. 2001 [++]) found a statistically significant difference between a dual diagnosis group and a severe mental illness-only group, with a greater number of people who were unemployed in the dual diagnosis group (184/273 [67%] versus 475/844 [56%]; OR 1.93 [1.35, 2.77], p=0.0003; I^2=0%) (see Appendix 10, forest plot 8.2).

Housing

Afuwape et al. (2006) [+] and Miles et al. (2003) [-] found that 3.3-6.6% of their dual diagnosis samples were currently homeless, and there were no significant differences between substance misuse groups (alcohol-only, alcohol and cannabis, cannabis-only and stimulants-only) in the number of participants who were homeless (p=0.17-0.52; Miles et al. 2003). A meta-analysis of 3 studies (N=591; Hipwell et al. 2000 [-]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]; Wright et al. 2000/2002 [++]) found evidence for an over 6 and a half-fold increased rate of history of homelessness or housing problems amongst individuals with severe mental illness who had coexisting substance misuse problems relative to those with severe mental illness and no recorded substance misuse problems (26/132 [20%] versus 15/459 [3%]; OR 6.43 [2.60, 15.93], p<0.0001; I^2=19%) (see Appendix 10, forest plot 8.3). In addition, Cantwell (2003) [++] found that there were nearly twice as many individuals with severe mental illness living in the most deprived areas (assessed using the Carstairs Deprivation Index and determined from participants' postcodes) in a dual diagnosis group relative to a severe mental-illness only control (21/64 [33%] versus 44/252 [17%]; OR 2.31 [1.25, 4.27]; p=0.008).

Violence and contact with the criminal justice system

Afuwape et al. (2006) [+] estimated the percentage of their dual diagnosis sample who had police contact as a perpetrator or victim in the 6 months prior to interview as 21.6% and 11.7% respectively (assessed using Client Service Receipt Inventory [CSRI]), and 35.2% had case-manager reported assaults or violent incidents in the previous 18 months.

Meta-analysis of 4 studies (N=907; Cantwell 2003 [++]; Hipwell et al. 2000 [-]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]; Wright et al. 2000/2002 [++]) found that the proportion of participants who had a recent history of contact with the criminal justice system was 3 times higher in a group with severe mental illness and comorbid substance misuse relative to a group with severe mental illness-only (89/196 [45%] versus 107/711 [15%]; OR 4.38 [2.90, 6.61], p<0.00001; I^2=13%) (see Appendix 10, forest plot 8.4). Hipwell et al. (2000) also found that dual diagnosis participants were more likely to have been the victim of a crime (9/16 versus 2/16; OR 9.00 [1.52, 53.40]; p=0.02). In addition, meta-analysis of 3 studies (N=574; Coid et al. 2006a [+]; Priebe et al. 2003/Fakhoury & Priebe 2006 [++]; Wright et al. 2000/2002 [++]) found an increased probability of a recent history of violent behaviour (violence recorded in case notes in previous 6 months to 2 years or self-reported violence in last 5 years) for those with dual diagnosis relative to those with severe mental illness-only (63/125 [50%] versus 130/449 [29%]; OR 2.81 [1.84, 4.28], p<0.00001; I^2=0%) (see Appendix 10, forest plot 8.5).

Rao et al. (2007)/Trathen et al. (2007) [-] compared the prevalence of dual diagnosis in patients attending a CMHT with a history of violence (any conscious action against a person that produced injury including bruising) to a group of patients attending a CMHT with no history of violence, and found a higher prevalence of dual diagnosis in the group with a history of violence (108/140 versus 144/319; OR 4.10 [2.61, 6.44]; p<0.00001).

Coid et al. (2006a) compared the number of respondents reporting violent behaviour in the last 5 years between cases with substance misuse and severe mental illness relative to controls with substance misuse-only and did not find a statistically significant difference between the groups (3/9 [33%] versus 124/336 [37%]; OR 0.85 [0.21, 3.48]; p=0.83).

Social functioning

A meta-analysis of 2 studies (N=412; Cantwell 2003 [++]; Leeson et al. 2012 [+]) compared social functioning (assessed using the Global Assessment Scale [GAS] or the Social Function Scale [Birchwood et al., 1990]) between a group with dual diagnosis and a group with severe mental illness-only and found no significant difference (SMD 0.18 [-0.45, 0.80]; p=0.58) (see Appendix 10, forest plot 8.6). However, heterogeneity was substantial to considerable with an I^2 value of 84%, and sensitivity analysis was not possible given that there were only 2 studies included in the meta-analysis. Weaver et al. (2003/2004) [++] also compared social functioning (assessed using the Social Function Questionnaire [SFQ]) between CMHT clients with substance misuse and CMHT clients without substance misuse and found

poorer social function in the dual diagnosis group (median 9 [range=0-21; N=119] versus 7 [range=0-21; N=151]; U = 6971.0, p=0.002).

Evidence Statement 1.1.9: Prevalence of social care needs in dual diagnosis

There is moderate to strong evidence from 4 cohort studies and 6 case-control studies on the social care needs of people with a dual diagnosis. There was some inconsistent evidence for education and social functioning outcomes. Evidence for other outcomes was generally consistent.

Education

There is moderate evidence from 2 case-control studies (1[+][5] and 1 [-][4]) and 1 cohort study [++][3] that there are no differences in education between dual diagnosis and severe mental illness-only groups. A meta-analysis of 2 studies (1 [++][3] and 1 [-][4]) found no difference in the number of participants leaving school by age 16 or with no qualifications between those with severe mental illness and coexisting substance misuse and those with severe mental illness-only (OR 1.71 [0.41, 7.06]; p=0.46; I^2=62%). Another study [+][5] also found no difference in mean years of education between cases with schizophrenia and lifetime cannabis use and controls with schizophrenia who had never used cannabis (MD -0.33 [-1.15, 0.49]; p=0.43).

Employment

There is strong evidence from 3 cohort studies (3 [++][3,6,8]) for differences in unemployment rates between a dual diagnosis group and a severe mental illness-only group. A meta-analysis of these 3 studies found a greater number of people who were unemployed in the dual diagnosis group (OR 1.93 [1.35, 2.77], p=0.0003).

Housing

There is strong evidence from 3 case-control studies (2 [++][1,10] and 1 [-][4]) and 1 cohort study [++][6] for differences in housing between those with severe mental illness with and without comorbid substance misuse. A meta-analysis of 3 studies (2 [++][6,10] and 1 [-][4]) found an increased probability of a history of homelessness or housing problems amongst the dual diagnosis group (OR 6.43 [2.60, 15.93], p<0.0001; I^2=19%). Another study [++][1] found an increased probability of living in the most deprived areas for a dual diagnosis group relative to a severe mental-illness only control (OR 2.31 [1.25, 4.27]; p=0.008).

Violence and contact with the criminal justice system

There is moderate evidence from 3 case-control studies (1 [++][10], 1 [+][2] and 1[-][7]) and 1 cohort study [++][6] about differential rates of violence in dual diagnosis groups. The evidence shows inconsistent results when comparing the effects of comorbid substance misuse (among those with severe mental illness) relative to the effects of comorbid severe mental illness (among those with substance

misuse). A meta-analysis of 3 studies (2 [++][6,10] and 1 [+][2]) found an increased probability of a recent history of violent behaviour for those with dual diagnosis relative to those with severe mental illness-only (OR 2.81 [1.84, 4.28]; p<0.00001; I^2=0%). Another study [-][7] also suggested a higher probability of violence in those with severe mental illness and co-existing substance misuse relative to those with severe mental illness only as a higher prevalence of dual diagnosis was found in patients attending a CMHT with a history of violence relative to a comparable group with no history of violence (OR 4.10 [2.61, 6.44]; p<0.00001). Conversely, a study [+][2] that compared self-reported violent behaviour in the last 5 years between cases with substance misuse and severe mental illness relative to controls with substance misuse-only found no difference between the groups (OR 0.85 [0.21, 3.48]; p=0.83).

There is strong evidence from 3 case-control studies (2 [++][1,10] and 1 [-][4]) and 1 cohort study [++][6] about differential contact with the criminal justice system amongst those with dual diagnosis. A meta-analysis of these 4 studies found an increased probability of a recent history of contact with the criminal justice system in a group with severe mental illness and co-existing substance misuse relative to a group with severe mental illness only (OR 4.38 [2.90, 6.61], p<0.00001; I^2=13%). One of these studies [-][4] also found that participants with a dual diagnosis were more likely to have been the victim of a crime (OR 9.00 [1.52, 53.40]; p=0.02).

Social functioning

There is strong evidence from 2 case-control studies (1 [++][1] and 1 [+][5]) and 1 cohort study [++][9] about the effects of substance misuse on social functioning amongst those with severe mental illness. However, evidence was mixed. A meta-analysis of 2 studies (1 [++][1] and 1 [+][5]) found no difference in social functioning between a group with dual diagnosis and a group with severe mental illness only (SMD 0.18 [-0.45, 0.80]; p=0.58; I^2=84%). Conversely, another study [++][9] compared social functioning between CMHT clients with substance misuse and CMHT clients without substance misuse and found poorer social function in the dual diagnosis group (U = 6971.0, p=0.002).

No evidence was found from English-language studies published from 2000 for other social care needs that were identified as being of interest in a dual diagnosis population, for example, social isolation, low income, history of being 'looked after' or adopted or domestic violence and abuse.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, the majority of the data were obtained from individuals in contact with secondary mental health services and it is likely that the social care needs of this group will be a conservative estimate of the needs in the wider undetected or disengaged dual diagnosis population.

[1]Cantwell 2003 (++)
[2]Coid et al. 2006a (+)

[3]Donoghue et al. 2014 (++)
[4]Hipwell et al. 2000 (-)
[5]Leeson et al. 2012 (+)
[6]Priebe et al. 2003/Fakhoury & Priebe 2006 (++)
[7]Rao et al. 2007/Trathen et al. 2007 (-)
[8]Virgo et al. 2001 (++)
[9]Weaver et al. 2003/2004 (++)
[10]Wright et al. 2000/2002 (++)

1.11 DISCUSSION

This evidence review suggests that dual diagnosis is relatively rare in the total population (estimates of 0.05-0.07%). However, the risk of comorbid substance misuse among people with severe mental illness or comorbid severe mental illness among people with substance misuse problems is considerably elevated. Participants for epidemiological studies were primarily recruited from caseloads of secondary mental health services or drug and alcohol addiction services, and estimates for prevalence of dual diagnosis in these settings (combined across studies) were 34.3% and 45.8% respectively. However, given the considerable heterogeneity of studies these estimates should be interpreted with great caution. An attempt was made to tackle some of the methodological challenges inherent in reviewing the literature on dual diagnosis. Unfortunately, sub-analyses were unable to identify significant contributors to inconsistency between prevalence estimates, either because studies differed on so many dimensions it was very difficult to make sense of these differences or because the small number of studies included in these sub-analyses meant that differences might be accounted for by peculiarities of individual studies. However, the estimates of prevalence are higher than those reported previously, particularly for substance misuse services. For instance, Carrá and Johnson (2009) in their systematic review of prevalence rates of psychosis and comorbid substance use in the UK found rates of 20-37% in mental health settings and 6-15% in addiction settings. This is of note, particularly given that most of the limitations of the studies are likely to result in an underestimate of prevalence. For the most part estimates are derived for individuals in contact with mental health services, drug or alcohol addiction services or primary care and as such exclude those who are not known or not eligible for these services. This is likely to be a sizeable group given that comorbid patients are at higher risk of disengagement from services and much mental illness goes undetected by the healthcare services.

This evidence review identified a number of gaps in the evidence. For instance, with the exception of age, gender and ethnicity, no evidence for any variation in other groups which were identified as being of interest (for example: people with a learning disability; teenage parents; travellers; asylum seekers or refugees; lesbian, gay, bisexual, transsexual or transgender people; sex workers) was identified. In addition, this review found no evidence for a number of health or social care needs, for example, the prevalence of coexisting physical health problems, social isolation, low income, history of being 'looked after' or adopted or domestic violence and abuse.

Although there is continued uncertainty concerning the exact scale of the problem, this systematic review, consistent with the findings of Crome et al. (2009) and the review of qualitative evidence for the NICE clinical guideline *Psychosis with Coexisting Substance Misuse* (CG120), found that the prevalence of health and social care needs are much higher for individuals with dual diagnosis than for comparable groups without a dual diagnosis, particularly for mental health symptom severity, medication non-adherence, homelessness, violence and contact with the criminal justice system as either a perpetrator or a victim.

REVIEW QUESTION 1.2: What is the current configuration of health and social care community services and the care pathway through which people in the UK with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up?

1.12 STUDIES CONSIDERED FOR REVIEW QUESTION 1.2

The electronic database search for all review questions in EconLit, HMIC and SPP databases identified 2319 records. Of these, full-text appraisal was conducted for 18 (and 2301 were excluded on the basis of title and abstract), of these 11 studies were included. An additional 15 (non-duplicated) papers were identified through database searches for RQ 1.1, however, all of these were excluded after full-text review. See Appendix 5 for PRISMA diagram, Appendix 8 for a bibliography of included studies, Appendix 9 for a bibliography of excluded studies with reasons for exclusion and Appendix 12 for full evidence tables.

1.13 EXPERT ADVISORY GROUP

In view of the paucity of published evidence on the current configuration of health and social care community services and dual diagnosis pathways, and the methodological challenges of interpreting the existing literature, an expert advisory group was convened. The expert advisory group was made up of the review team and Dr. Ron Alcorn (Queen Mary University of London Medical School and East London Foundation Trust), Dr. Hermine Graham (University of Birmingham) and Professor Liz Hughes (University of Huddersfield and South West Yorkshire Partnership NHS Foundation Trust). Dr. Ron Alcorn is a consultant psychiatrist for a multidisciplinary specialist young person's alcohol and drug service in East London (ASATS) and has a background in substance misuse psychiatry and service development in this field. Dr. Hermine Graham is a consultant clinical psychologist and has led in the development and evaluation of an integrated treatment and service model for people with dual diagnosis in Birmingham, the Combined Psychosis and Substance Use Programmes (COMPASS), which has been highlighted as a model of good practice by the Department of Health. Dr. Hermine Graham works clinically with people with severe mental illness in an assertive

outreach setting in the community. Professor Liz Hughes is editor of the Advances in Dual Diagnosis journal and Senior Lecturer in mental health and addictions. She was also the author of *Closing the Gap: A capability framework for working effectively with people with combined mental health and substance use problems (dual diagnosis)*. The group met on the 23rd April 2015 with the aims of mapping the current UK care pathway and identifying examples of good service. The review team used brainstorming methods to elicit information.

The key learning from this discussion was that there is not currently a service configuration that is in place nationally. However, there are some examples of good practice in the UK. The expert advisory group highlighted the Turning Point (2007) *Dual Diagnosis: Good Practice Handbook* as a source of good practice case studies. Overall 12 case studies outlined within this document met the inclusion criteria for this review and have been incorporated into the summary of evidence.

1.14 SUMMARY OF THE EVIDENCE FOR REVIEW QUESTION 1.2

Adult services

Six adult services were described within 6 studies of national, regional or local reports, assessments or evaluations (Bayney et al. 2002 [+], Dugmore 2011 [+], Mental Health Network 2009 [-], Sims 2003 [+], Swinden & Barret 2008 (+), Trippier & Parker 2008 [+]). These were:

- Baseline – Leicestershire NHS Partnership Trust
- The Combined Psychosis and Substance Use Programmes (COMPASS) – Birmingham and Solihull
- The County Durham Dual Diagnosis Project - County Durham and Darlington NHS Foundation Trust
- The Mental Illness and Drug and Alcohol Service (MIDAS) – West Hertfordshire Health Authority
- The Specialist Dual Diagnosis Service - North West Wales NHS Trust
- The Westminster Dual Diagnosis Team

An additional 6 services were identified in the Turning Point (2007) *Dual Diagnosis: Good Practice Handbook* (++)*.* These were:

- The Amber Project
- The Friday Group
- Intensive Management of Personality Disorder: Assessment and Recovery Team (IMPART)
- The Lewisham Dual Diagnosis Service
- The Nottinghamshire Dual Diagnosis Service
- Turning Point Support Link

Summary of findings

COMPASS, MIDAS and the Westminster Dual Diagnosis Team cater for people with a serious mental illness comorbid with drug or alcohol misuse, whereas the following services accept patients with any mental illness with drug or alcohol misuse: The Amber Project, the County Durham Dual Diagnosis Project, The Friday Group, the Lewisham Dual Diagnosis Service, the Nottinghamshire Dual Diagnosis Service, Specialist Dual Diagnosis Service, Turning Point Support Link. IMPART exclusively sees patients with personality disorders, whereas Baseline only accepts patients with stimulant misuse in addition to any mental illness. All the services accept referrals and provide initial assessments of patients. The following services also provide training to staff members and to workers in other services: Baseline, COMPASS, the County Durham Dual Diagnosis Project, IMPART, the Lewisham Dual Diagnosis Service, Nottinghamshire Dual Diagnosis Service, the Specialist Dual Diagnosis Service and the Westminster Dual Diagnosis Team.

Service structure and links with physical health services, social care services and voluntary sectors

The following services are integrated into existing mental health and drug and alcohol misuse services: Baseline, The County Durham Dual Diagnosis Project, The Specialist Dual Diagnosis Service and The Nottinghamshire Dual Diagnosis Service. They mainly provide a consultory service, specifying clinical need and signposting service users to relevant mental health and substance misuse services. They also liaise with staff from existing services and provide support and training. Baseline and The Specialist Dual Diagnosis Service also carry out assessments for patients with a dual diagnosis.

COMPASS, the Westminster Dual Diagnosis Team and the Lewisham Dual Diagnosis Service also promote an integrated model of care as they provide a consultation service to existing mental health and substance misuse services. However, they are also specialised dual diagnosis teams who deliver interventions and provide short-term management of service users. COMPASS and the Lewisham Dual Diagnosis Service are integrated within existing mental health and substance misuse services. COMPASS reports good links with mental health and substance misuse services and also works with housing employment local universities and training providers.The Westminster Dual Diagnosis team does not fall into the management structure of an existing service, however it co-ordinates with community mental health teams and inpatient services.

The following services are all separate from existing mental health and drug and alcohol services: MIDAS, IMPART, The Amber Project, Turning Point Support Link and The Friday Group. MIDAS and IMPART both provide assessments, treatment and advocacy for patients using a multi-disciplinary approach. MIDAS accepts all service users with a dual diagnosis, whereas IMPART only assists those with a non-forensic personality disorder. Turning Point Support Link is a community based service which provides practical and emotional support to service users with mental health and substance misuse difficulties. The aim is to improve service users' quality of life and increase independence. It also supports service users by providing links to

community services such as education, sport, and volunteering as well as signposting to other services. The Amber Project is a dual diagnosis service which specifically provides assessments, therapy and advice for lesbian, gay, bisexual and transgender (LGBT) people. The service provides assessments and psychotherapeutic interventions as well as supporting access to a range of LGBT-friendly support services and other mainstream mental health and social services including housing, advocacy support and relapse prevention groups. The Friday Group is a community based self-help group which is run by service users with a dual diagnosis. It is a joint project between community mental health teams and substance misuse services and as such, group facilitators can provide information about other mainstream services and facilitate referral. The service is provided for 2 hours a week and its main aim is to reach disengaged service users and to provide social activities, a hot meal and discussions. External speakers are also invited, at the request of the group, to give presentations. Previous topics have included vocational projects, debt and benefits.

Staffing

Baseline, The County Durham Dual Diagnosis Project, The Specialist Dual Diagnosis Service and The Nottinghamshire Dual Diagnosis Service are run by specialist dual diagnosis nurses, psychiatrists or project managers who mainly offer a consultancy role. For MIDAS and IMPART staffing consists iofcommunity psychiatric nurses, clinical psychologists, occupational therapists, drug and alcohol workers, support workers and administrative staff. COMPASS comprises a specialised team of staff who work withing existing mental health and substance misuse services. The Westminster Dual Diagnosis Team consists of 3 specialist workers and a clinical lead who are all reported to have good experience in dual diagnosis. The Lewisham Dual Diagnosis Service has a similar set up with 6 dual diagnosis practitioners and a team leader. Additionally, it also has an addictions consultant psychiatrist who provides support to the service for 1 session every month. The Amber Project is run by 2 qualified psychotherapists who work part-time. At Turning Point Support Link staff members come from a range of backgrounds each with previous work experience in dual diagnosis. The Friday Group is a community based self-help group which is run by service users with a dual diagnosis and facilitated by workers from community mental health teams and substance misuse services.

Funding

The Westminster Dual Diagnosis Team, the County Durham Dual Diagnosis Project, the Lewisham Dual Diagnosis Service and the Nottinghamshire Dual Diagnosis Service were all funded by locate Drug and Alcohol Action Team (DAAT) and primary care trusts (PCTs). COMPASS is funded by 3 PCTs covering North Birmingham. Funding for IMPART mainly came from existing commissioning structures, with additional support from the local DAAT. The Friday Group also received funding from the local DAAT, with staffing costs from the community mental health teams and drug and alcohol service. The Amber project was funded by a Section 64 Department of Health grant. Turining Point Support Link was funded through Hertfordshire’s Joint Commissioning Team.

Funding was not reported for MIDAS, Baseline and the Specialist Dual Diagnosis Service.

Service user, family and carer involvement

Overall, service users, families and carers were involved in many aspects of the services located, including the development of interventions and training, participation in steering meetings and through the provision of feedback.

At the County Durham Dual Diagnosis Project, service users, carers and families were were consulted on the gaps and barriers experienced in accessing effective services which informed the development of the strategy implementation plan. At the Nottinghamshire Dual Diagnosis service service users participated in steering group meetings and interviews for the recruitment of staff. They were also involed in training and education programmes along with carers. At IMPART service users were also involved in steering group meetings and also provided support in reviewing policies and providing feedback during service evaluations. IMPART also holds a monthly recovery forum where service users can understand the concept of recovery and provide feedback on developments in the service which would aid recovery for them or others. At COMPASS service users are involved in the development of training materials and a manual for a specialised cognitive behavioural intervention. When attending the Amber Project service users are encouraged to define their own needs and goals and to provide feedback about the service when evaluations are carried out. Efforts are also made to support carers and family members and help them support the needs of the service user. At Turning Point Support Link staff gain service user feedback through reviews and evaluations of support plans and feedback questionnaires about the service as a whole. Families and friends are involved as appropriate, giving advice without breaking confidentitality. The Friday Group is a service user led service which was set up to meet needs in disengaged service users. This group allows service users to have a direct influence in shaping local dual diagnosis service developments.

Following feedback from carers about the lack of information regarding drug misue and its impact on mental health, The Westminster Dual Diagnosis Team initiated the provision of 2 education sessions twice a year. These cover topics such as general drug and alcohol education, what dual diagnosis means and how to access services. The Lewisham Dual Diagnosis Service provides a local carers group which is consulted about dual diagnosis strategy and policy development.

There was no information about the involvement of service users or carers in the following services: Baseline, MIDAS, and the Specialist Dual Diagnosis Service.

Current availability of services

COMPASS, the Specialist Dual Diagnosis Service and IMPART are all still running. For most services it remains unclear whether they are still running due to unavailable or out of date contact details or no response in the time frame which was available to the review team. These were: the Amber Project, the County Durham Dual

Diagnosis Project, the Lewisham Dual Diagnosis Service, MIDAS, Nottinghamshire Dual Diagnosis Service, Turning Point Support Link the Westminster Dual Diagnosis Team. Baseline and the Friday Group no longer exist as dual diagnosis services.

Adolescent services

Fourteen adolescent services were described in 1 study (National Treatment Agency for Drug Misuse, 2007 [+]). These were:

- The Adolescent Drug and Alcohol Service (A-DASH) - Hertfordshire
- Birmingham Young People's Service
- CAMHS Specialist Substance Misuse Service (CSSS) - London
- The Head2Head Team - Nottingham
- IMPACT, Drug and alcohol treatment for young people – Norfolk
- Lambeth's "virtual integrated team"
- The Lock – Stoke-on-Trent
- The Mental Health and Young People's Services - Bradford
- SUBS – Wolverhampton's young people's drug and alcohol team
- Wiltshire's Young People's Substance Misuse Service
- The Young People's Drug and Alcohol Service - Newcastle upon Tyne
- The Young People's Drug Treatment Service - Bristol
- The Young People's Substance Misuse Services - County Durham
- The Young Person's Substance Misuse Services - Waltham Forest, London

Summary of findings

These services are mainly drug and alcohol services which are structured within existing child and adolescent mental health services (CAHMS), although some services provide specialised treatment for patients with dual diagnosis. All services accept referrals and treat patients within the service. A-DASH, CSSS and IMPACT also provide training and support to other agencies and services.

Service structure and links with physical health services, social care services and voluntary sectors

Four services are separate multi-disciplinary services. Head2Head is a Tier 3 service and the only one which specifically caters for adolescents with a dual diagnosis and accept referrals from Nottingham and county-wide. It also provides training and support to external agencies such as Tier 2 drug and alcohol services. IMPACT and The Lock are both multi-disciplinary and multi-agency specialist services specifically for adolescents with drug and alcohol problems. Both services provide a holistic approach with mental health needs addressed within the same service. IMPACT works closely with other agencies and services to provide support with issues such as housing, education, training, employment and benefits. The Lock reports good links with physical health services (GP, dentist, community paediatrician, physician and surgeon) and with mental health services if psychiatric co-morbidity cannot be treated within the service. SUBS also has a similar approach, however from the description it is unclear whether mental health needs are met within the service in

addition to drug and alcohol misuse or whether patients are referred on to other services.

Three adolescent services are integrated teams of staff members from different services and agencies who work collaboratively. Lambeth's "virtual integrated team" is a substance misuse team who work from the respective bases of their own agencies providing assertive outreach to patients seen in a range of settings including mental health clinics, schools and GP services. The Birmingham Young People's Service receives both psychiatric and specialist substance misuse input and reportes good links with CAHMS substance misuse team, Tier 3 and Tier 4 CAHMS, youth offending teams and the adults' addicion psychiatrists. The Mental Health and Young People's Service in Bradford is a collaboration of 3 services: the local CAMHS, an under-18s substance misuse team and a local voluntary sector street agency. It reports good links with local housing providers and hostels, physical health nurses and adult services. The team provides engagement, assessment of needs (including housing, mental health, drugs misuse and relationships) and the generation of appropriate care and intervention plans.

Seven of the services are specialist adolescent drug and alcohol or dual diagnosis services which reside within existing CAMHS. The Young People's Drug and Alcohol Service (Newcastle), CSSS and The Young People's Drug Treatment service (Bristol) all aim to assess and treat mental health problems and substance misuse within the service. The Young People's Drug and Alcohol Service in Newcastle reports good links with local youth offending teams, schools, educational projects, the voluntary sector childrens homes and mental health services which have led to improved awareness of substance use issues throughout CAHMS. CSSS reports good links with CAHMS, youth offending teams, social services departments, schools, universal and targeted young people's substance misuse agencis and voluntary sector projects. Conversely, the A-DASH, the Wiltshire Young People's Substance Misuse service, and the Young Person's Substance Misuse Services in Waltham Forest and County Durham mainly provide advice, support and interventions only for drug and alcohol misuse. A-DASH has excellent co-ordination with 4 quadrant CAHMS services, residential units and the adolescent outreach team. It also reports good links with children's and young people health services, Connexions, various non-statutory services such as the Prince's Trust and adult drug services. The Young Person's Substance Misuse Services in Waltham Forest include both Tier 2 and Tier 3 services, which work well in partnership and reports good links with other services, including counselling and education services, social services, youth offending and adult community drug and alcohol.

Staffing

At Head2Head, staff consist of a service team leader, a consultant child and adolescent psychiatrist, a dual diagnosis nurse and a treatment nurse. At IMPACT, staff members include a team of specialist nurses, social workers, youth workers and other professionals and is supported by specialist doctors. The Lock's team includes a part-time consultant addition psychiatric, a project manager, drug workers and supported housing workers. At any one time there is usually a senior psychiatric, medical trainee or specialist registrar. The team at SUBS includes a team manager,

youth engagement and support workers, young people's substance treatment workers, a youth offending team substance worker, a paediatric nurse, resettlement aftercare provision (RAP) workers and an administrator. Lambeth's virtual integrated team includes a psychiatrist, clinical nurse specialists, occupational therapists, psychologists, social workers and drug workers to ensure that both mental health and substance misuse needs are addressed. Birmngham's Young People's service consists of a team of practitioners from the young person's substance misuse service and Birmingham Children's Hospital CAMHS. The Mental Health and Young People's Services in Bradford consists of a consultant psychiatrist, a clinical nurse specialist, a CAMHS therapist, substance misuse workers, social workers, youth workers, education workers and arrest referral workers. Young People's Drug and Alcohol Service in Newcastle, the CSSS and the Young People's Drug Treatment Service in Bristol all aim to assess and treat mental health problems and substance misuse within the service. As such staff members include consultant psychiatrists, nurses with addiction and adolescent mental health training, specialist drug workers and social workers. Whilst each service has links with mental health services, at A-DAH, Wiltshire's Young People's Substance Misuse Service, the Young People's Substance Misuse Services in Waltham Forest and County Durham, staff mainly consist of drug workers and addiction consultants who primarily address drug and alcohol misuse.

Funding

A-DASH is commissioned by Hertfordshire's joint commissioning partnership whereas the The Young Person's Substance Misuse Services in Waltham Forest is commissioned by the local drug and alcohol action team partnership. For all other services, funding sources were not reported.

Service user, family and carer involment

The Lock involves service users in the planning and development of the service provision for young people, their carers and their families. For all other services it was unclear how service users, family and carers were involved.

Current availability of services

Most of the adolescent services described are still running. These were: A-DASH, Birmingham Young People's Service, CSSS, Head2Head, The Lock, the Mental Health and Young People's Services in Bradford, the Young People's Drug Treatment Service in Bristol, The Young People's Drug and Alcohol Service in Newcastle.

For IMPACT, Lambeth's "virtual integrated team", SUBS, the Young People's Substance Misuse Services in Waltham Forest and County Durham it was unclear whether they are still running due to unavailable or out of date contact details or no response in the time frame which was available to the review team. Wiltshire's Young People's Substance Misuse Service no longer exists.

Networking, education and training

Nine education and training services were described in 4 studies (Bailey 2002 [+], Bell 2014 [++], Gorry 2008 [+], Manley et al. 2008 [+]). These were:

- Croydon Managers Dual Diagnosis Forum
- East Midlands Regional Dual Diagnosis Network
- The Experiences Nurse Rotation Scheme, Central and North West London and West London Mental Health NHS Trust
- Illicit Drugs and Mental Health Training Course
- Leeds Dual Diagnosis Project
- Manchester Collaborative
- National Institute of Mental Health in England (NIMHE) Dual Diagnosis Programme
- Nottingham University Dual Diagnosis Module
- West Midlands Dual Diagnosis Network

Three additional educational and training services were located in the Turning Point (2007) *Dual Diagnosis*: *Good Practice Handbook* [++]. These were:

- The Croydon Dual Diagnosis Service
- The Dual Diagnosis Course – York University
- The Humber Mental Health Teaching Trust Dual Diagnosis Liaison Service (DDLS)

Summary of findings

Education and training programmes for practitioners

Seven services provide education and training to students and health practitioners. Three of these services are higher education courses provided at Birmingham University, Nottingham University and York University. The Manchester Collaborative, the DDLS and the Croydon Dual Diagnosis Service deliver formal and informal training sessions for healthcare professionals which are delivered by staff experienced in dual diagnosis from a broad range of addiction and mental health services. The aim of training is to enhance the quality of services in the area using a bottom-up approach. The Experiences Nurse Rotation Scheme offers opportunities for career development for experienced nurses and supports their motivation to work within dual diagnosis services.

Forums and networks

Five of the services provide forums where commissioners, service providers, practitioners and service users can network and discuss developments in dual diagnosis services. The Croydon Managers Dual Diagnosis Forum promotes collaboration between agencies by updating participants on local and national dual diagnosis developments and through case discussions. The East Midlands and West Midlands Dual Diagnosis Networks run forums where service providers, carers, service users and professionals can meet and learn more about areas of dual

diagnosis development through presentations and discussions. The Leeds Dual Diagnosis project facilitates working groups and forums to promote collaboration between commissioners, strategic managers and dual diagnosis practitioners from services across Leeds. The NIMHE Dual Diagnosis Programme supports service providers and commissioners by providing working groups and forums.

Service user, family and carer involvement

At York University, the Dual Diagnosis course invite service users to facilitate educational sessions, where they share their own experience of services with students, as well as providing video material which is included in training sessions. This is similar to the Dual Diagnosis module at Nottingham Unviersity where service users and carers actively participate in the course by leading sessions to demonstrate the importance of a service user perspective for effective service delivery. The DDLS has involved service users in training and group work which helps with peer support and modelling.

At the East Midlands Forum, service users and carers attend meetings where learning opportunities are developed collaboratively through presentation and discussions. The West Midlands Network is also open to service users and carers who collaborate with practitioners and commissioners to discuss dual diagnosis developemnts, evidence-based practice and policy. Service users are involved more formally at the Leeds Dual Diagnosis Project where they form the Dual Diagnosis Expert Reference Group. This is a group of expert consultants with lived experience of dual diagnosis, which is part of the Dual Diagnosis Strategy Group, and who provide strategic direction for the development of dual diagnosis in Leeds. The Croydon Dual Diagnosis Service has involved a representative from the local mental heath service user group in the dual diagnosis steering group since its inception. Members from the local service user group have attended the 5 day dual diagnosis course.

Service user and carer involvement was not reported in the descriptions of 4 services. These were: the Croydon Managers Dual Diagnosis Forum, the Experiences Nurse Rotation Scheme, the Illicit Drugs and Mental Health Training Course at Birmingham University and the Manchester Collaborative.

Funding

The Croydon Managers Dual Diagnosis Forum is funded by the Department of Health pooled treatment budget via the DAAT and the London Borough of Croydon Adult Social Services. The Dual Diagnosis Liaison Service is partly funded by the mental health income from 2 PCTs (Hull and the East Riding of Yorkshire). The Leeds Dual Diagnosis project is commissioned by the NHS and managed by a third sector organisation. The Manchester collaborative is funded by the Manchester Drug and Alcohol Strategy Group, which represents: the DAAT, Manchester Mental Health and Social Care NHS Trust, Manchester City Council and other health and social care providers. The Dual Diagnosis course at York University is jointly funded by the Workforce Development Confederation and the National Treatment Agency for Substance Misuse.

Funding was not reported in descriptions of the following services: the Croydon Managers Dual Diagnosis Forum, the Dual Diagnosis module at Nottingham Unviersity, the East Midlands Forum, the Experiences Nurse Rotation Scheme, the Illicit Drugs and Mental Health Training Course at Birmingham University and the West Midlands Network.

Current availability of services

The Leeds Dual Diagnosis Project, the Dual Diagnosis course at York University and the Experiences Nurse Rotation Scheme are still running. For the following services it was unclear whether they are still running due to unavailable or out of date contact details or no response in the time frame which was available to the review team: the Croydon Managers Dual Diagnosis Forum, The Croydon Dual Diagnosis Service, the DDLS, the East Mindlands Forum, the Manchester Collaborative and the West Midlands Network. The Illicit Drugs and Mental Health Training Course at Birmingham University and the Dual Diagnosis module at Nottingham Unviersity are no longer listed on the University's course websites.

Evidence Statement 1.2.1: Current configuration of health and social care community services for people with dual diagnosis

There is moderate evidence from 12 studies of national, regional or local reports, assessments or evaluations (2 [++][3,12], 9[+][1,2,4-6,8-11] and 1[-][7]) describing current service delivery structures of community services for people with dual diagnosis in the UK. Twelve adult services were described within 6 studies (1 [++][12], 4 [+][2,4,9,11] and 1 [-][7]). Fourteen adolescent services were described in 1 study [+][8]. Twelve education and training services were described in 5 studies (2 [++][3,12] and 3 [+][1,5,6]). Overall the evidence highlights great inconsistencies in the configuration of dual diagnosis services within NHS trusts across the UK. These inconsistencies lie in a number of areas including sources of funding, structure of services, type of staff members, services delivered and coordination of care. Despite the variability in findings, the services can be divided into 5 broad categories:
(a) separate dual diagnosis services which accept referrals and provide interventions
(b) integrated services run by staff members from mental health and substance misuse services who accept referrals and provide interventions
(c) integrated teams who provide support and advice to existing mental health and substance misuse services acting as consultants and ensuring adequate service provision for dual diagnosis service users
(d) groups providing opportunities for networking
(e) educational courses and skills training.

Applicability to the UK:
This evidence is directly applicable because all included studies were conducted in the UK. However, as a large number of these services are no longer running, the current configuration of community services remains unclear.

[1]Bailey 2002 (+)

[2]Bayney et al. 2002 (+)
[3]Bell 2014 (++)
[4]Dugmore 2011 (+)
[5]Gorry & Dodd 2008 (+)
[6]Manley et al. 2008 (+)
[7]Mental Health Network 2009 (-)
[8]National Treatment Agency for Drug Misuse 2007 (+)
[9]Sims et al. 2003 (+)
[10]Swinden & Barret 2008 (+)
[11]Trippier & Parker 2008 (+)
[12]Turning Point 2007 (++)

1.15 DISCUSSION

The review of current service configuration for adults and young people with dual diagnosis was marked in its lack of any coherent national framework or structure, in spite of consensus agreements on key elements of treatment approaches, most notably, the Department of Health (2002) *Dual Diagnosis Good Practice Guide* which advocates the integrated model of care. This is probably because service configurations, treatment philosophies and funding streams mitigate against integrated provision in the UK, with separate mental health and substance misuse services that are often provided by different organisations, have different organisational and managerial structures, and staff within each service often lack the knowledge and skills for working with people from the 'other' group.

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APPENDICES

APPENDIX 1. Sample search strategy

RQ 1.1: What are the health and social care needs of people in the UK with a severe mental illness who also misuse substances?

RQ 1.2: What is the current configuration of health and social care community services and the care pathway through which people in the UK with coexisting severe mental illness and substance misuse are recognised, treated, managed and followed-up?

Database(s): **Ovid MEDLINE(r)** 1946 to March week 1 2015
Search strategy:

#	searches	Results
1	affective disorders, psychotic/ or exp bipolar disorder/ or depressive disorder/ or depressive disorder, major/ or depressive disorder, treatment resistant/ or exp psychotic disorders/ or exp schizophrenia/ or "schizophrenia and disorders with psychotic features"/ or schizophrenic psychology/	211776
2	emergency services, psychiatric/ or hospitals, psychiatric/ or psychiatric department, hospital/ or (mentally ill persons/ and (inpatients/ or hospitalization/))	29602
3	((bipolar* adj (depres* or disorder*)) or ((cyclothymi* or rapid or ultradian) adj2 cycl*) or rcbd or mania* or manic*).ti,ab.	28233
4	(delusional disorder* or psychos* or psychotic* or schizophren*).ti,ab.	188410
5	(psychiatric adj2 (admission* or admit* or comorbid* or co morbid* or emerg* or hospital* or inpatient* or in*1 patient* or morbid* or outpatient* or patient* or population*)).ti,ab.	35625
6	depres*.ti,ab.	302192
7	(((acute or chronic* or serious* or severe) adj (mental* or psychiatric* or psychological*) adj (condition* or disease* or disorder* or disturbanc* or ill*)) or smi*1).ti,ab.	9823
8	(comorbidity/ and exp mental disorders/) or ((comorbid* or co morbid* or coexist* or co exist* or concur* or cooccur* or co occur*) adj2 (mental* or psychiatric* or psychological*) adj2 (condition* or disease* or disorder* or disturbanc* or ill*)).ti,ab.	30006
9	or/1-8	576521
10	exp alcohol-related disorders/ or alcoholics/ or amphetamine related disorders/ or cocaine related disorders/ or drug overdose/ or inhalant abuse/ or marijuana abuse/ or exp opioid related disorders/ or	217373

	phencyclidine abuse/ or psychosis, substance induced/ or substance abuse, intravenous/ or substance related disorders/ or exp substance withdrawal syndrome/	
11	designer drugs/ or drug overdose/ or needle exchange programs/ or needle sharing/ or exp street drugs/ or substance abuse detection/ or substance abuse treatment centers/	29771
12	(alcohol* adj2 (abstain* or abstinen* or abus* or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or nonprescri* or non prescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	34639
13	((amphetamin* or crystal meth* or desoxyn or dexamfetamin* or dexedrine or dextroamphetamin* or methamphetamin* or psychostimulant* or stimulant* or uppers) adj2 (abstain* or abstinen* or abus* or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or nonprescri* or non prescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	3391
14	((amphetamin* or crystal meth* or desoxyn or dexamfetamin* or dexedrine or dextroamphetamin* or methamphetamin* or psychostimulant* or stimulant* or uppers) adj2 (usage* or use or user* or uses or using or utiliz* or utilis*)).ti,ab.	3635
15	((benzoylmethyl ecgonine or cocain* or crack*1 or codrenine or ecgonine methyl ester benzoate or erythroxylin or locosthetic or neurocaine or sterilocaine) adj2 (abstain* or abstinen* or abus* or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or nonprescri* or non prescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	6860
16	((benzoylmethyl ecgonine or cocain* or crack*1 or codrenine or ecgonine methyl ester benzoate or erythroxylin or locosthetic or neurocaine or sterilocaine) adj2 (usage* or use or user* or uses or using or utiliz* or utilis*)).ti,ab.	6262
17	((bhang or cannador or cannabis or ganja or ganjah or hashish or hemp or marihuana or marijuana or sativex or skunk) adj2 (abstain* or abstinen* or abus* or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or nonprescri* or non prescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	1991
18	((bhang or cannador or cannabis or ganja or ganjah or hashish or hemp or marihuana or marijuana or sativex or skunk) adj2 (usage* or use or user* or uses or using or utiliz* or utilis*)).ti,ab.	6815
19	((acetomorphine or anpec or diacephine or diacetylmorphin* or diacetylmorphine* or diagesil or diagesil or diamorf* or diamorf* or diamorphin* or diamorphin* or diaphorin or duromorph or epimorph or heroin or morfin* or morphacetin or morphia or morphian* or morphin* or morphium or opso*1 or skenan) adj2 (abstain* or abstinen* or abus*	7959

	or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or nonprescri* or non prescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	
20	((acetomorphine or anpec or diacephine or diacetylmorphin* or diacetylmorphine* or diagesil or diagesil or diamorf* or diamorf* or diamorphin* or diamorphin* or diaphorin or duromorph or epimorph or heroin or morfin* or morphacetin or morphia or morphian* or morphin* or morphium or opso*1 or skenan) adj2 (usage* or use or user* or uses or using or utiliz* or utilis*)).ti,ab.	4541
21	or/10-20	245864
22	abus* product*.ti,ab.	9
23	((drug*1 or polydrug* or psychotropic* or substance*) adj2 (abstain* or abstinen* or abus* or addict* or banned or excessive us* or criminal or depend* or habit* or illegal* or illicit* or intoxicat* or misus* or non prescri* or nonprescri* or overdos* or over dos* or recreation* or rehab* or unlawful* or withdraw*)).ti,ab.	74104
24	(((alcohol* or drug*1 or polydrug* or recreation* or substance*) adj use*1) or alcoholi*).ti,ab.	131301
25	((club or designer or street) adj (drug* or substance*)).ti,ab.	1349
26	((crav* adj2 (alcohol* or inject*)) or hard drug* or needle fixation or soft drug* or vsa*1).ti,ab.	1862
27	or/22-26	189834
28	or/21,27	325822
29	"diagnosis, dual (psychiatry)"/	2942
30	(chemical* adj (user or addict*) adj3 ((mental* or psychiatric* or psychological*) adj (condition* or disease* or disorder* or disturbanc* or ill*))).ti,ab.	7
31	((comorbid* or co morbid* or coexist* or co exist* or concur* or cooccur* or co occur*) adj5 (addict* or ((drug or substance*) adj5 (abus* or misus))) adj3 ((mental* or psychiatric* or psychological*) adj (condition* or disease* or disorder* or disturbanc* or ill*))).ti,ab.	223
32	((dual* or tripl*) adj2 diagnos*).ti,ab.	1858
33	or/29-32	4202
34	(9 and 28) or 33	49921
35	exp general practice/ or general practitioners/ or physicians/ or physicians, family/ or physician's practice patterns/ or physicians, primary care/ or physicians, women/ or primary health care/	223806
36	(clinician* or ((general or family) adj practic*) or ((family or primary) adj (care or healthcare or medical care or medicine)) or family doctor* or gp*1 or physician* or practitioner*).ti,ab.	572226
37	or/35-36	671790
38	community care/ or community based rehabilitation/ or community	113324

	health centers/ or exp community health nursing/ or community health services/ or community integration/ or community medicine/ or community mental health centers/ or community mental health services/ or community networks/ or community pharmacy services/ or community program/ or community psychiatry/ or emergency shelter/ or home care agencies/ or home care services/ or home care services, hospital-based/ or home health nursing/ or exp home nursing/ or house calls/	
39	((exp rehabilitation/ or exp rehabilitation centers/ or rehab*.ti,ab. or rh.fs.) and communit*.sh,ti,ab.)	25798
40	(((communit* or home*) adj3 (agenc* or care or center* or centre* or clinic* or consultant* or doctor* or employee* or expert* or facilitator* or healthcare or instructor* or leader* or manager* or mentor* or nurs* or personnel* or pharmacy or pharmacist* or psychiatrist* or psychologist* or psychotherapist* or specialist* or staff* or team* or therapist* or tutor* or visit* or worker*)) or care management team* or domiciliary care* or homecare or linkworker* or link worker*).ti,ab.	95072
41	(camhs or cmht*1).ti,ab.	236
42	(((communit* or home*) adj2 (assessment or evaluation or monitor*)) or (needs assessment and communit*)).ti,ab.	12730
43	((communit* or home*) adj (based or deliver* or interact* or led or maintenance or mediat* or operated or provides or provider* or run or setting*)).ti,ab.	46610
44	((communit* or home*) adj2 group*).ti,ab.	4875
45	((communit* or home*) adj3 (advice* or advis* or aftercare or assist* or casework* or case work* or counsel* or educat* or help* or integrat* or liaison* or mentor* or network* or reinforc* or reintegrat* or sector* or setting* or support* or visit*)).ti,ab.	45174
46	((communit* or home*) adj3 (intervention* or program* or rehab* or therap* or service* or skill* or treat*)).ti,ab.	51780
47	(communit* adj5 (advocacy or apprenticeship* or awareness campaign* or development group* or empower* or employ* or inclusi* or individual support* or personal assistan* or selfadvocacy or selfemploy* or self advocacy or self employ* or support* or train*)).ti,ab.	13086
48	(health adj (cent* or visit*)).ti,ab.	22370
49	independent sector*.ti,ab.	153
50	((non institutional* or noninstitution*) adj2 (sector* or setting*)).ti,ab.	113
51	or/38-50	274637
52	((pharmacist* or pharmacies or pharmacy) adj3 (advice* or care* or communit* or counsel* or educat* or intervention* or liaison* or program* or rehab* or service*)).ti,ab.	9720
53	(pharmacist* adj3 (frontline or front line or face to face or one to one)).ti,ab.	37
54	or/52-53	9735

55	foster home care/ or exp rehabilitation centers/ or social support/ or social work/ or social work, psychiatric/ or social welfare/	88921
56	((child adj2 protect*) or (child* adj3 (foster* or in*1 care or looked after or residential care)) or foster care).ti,ab.	4133
57	(social* adj2 (care or security or welfare or work*)).ti,ab.	25345
58	((social* or welfare) adj3 (advice* or advis* or aftercare or assist* or casework* or case work* or counsel* or educat* or help* or integrat* or liaison* or mentor* or network* or reintegrate* or setting* or support* or visit*)).ti,ab.	42208
59	(social* adj3 (intervention* or program* or rehab* or service* or therap* or treat*)).ti,ab.	19385
60	or/55-59	141168
61	ambulatory care/ or exp ambulatory care facilities/ or case management/ or day care/ or hospitals, rural/ or rural populations/ or exp outpatient clinics, hospital/ or rural health services/	141272
62	((act adj (model* or team*)) or (assertive adj1 community adj1 treatment) or ((care or case) adj management) or (care adj1 program* adj1 approach) or cap or (madison adj4 model*) or (training adj2 (community adj1 living)) or pact or tcl).ti,ab.	41321
63	((ambulatory or outreach* or out reach*) adj3 (advice* or advis* or aftercare or assist* or casework* or case work* or counsel* or educat* or help* or integrat* or liaison* or mentor* or network* or reintegrate* or sector* or setting* or support* or visit*)).ti,ab.	6709
64	((ambulatory or outpatient* or out patient*) adj (based or deliver* or interact* or led or mediat* or operated or provides or provider* or run or setting*)).ti,ab.	7971
65	((ambulatory or outpatient* or out patient*) adj3 (intervention* or program* or rehab* or service* or treat*)).ti,ab.	22702
66	((outreach* or out reach* or remote or rural* or (social* adj2 (exclus* or isolat*)) or suburban* or urban*) adj3 (assist* or intervention* or program* or service* or treat*)).ti,ab.	12237
67	(care program* or daily living program* or ((ambulatory or day or posthospital* or post hospital*) adj2 (care or center* or centre* or clinic* or facilit* or hosp* or intervention* or treatment* or unit*)) or daycare or day case or dropin* or drop in* or dispensar* or domiciliar* or (home adj2 (care or treatment)) or (partial* adj2 hosp*)).ti,ab.	101383
68	mobile support* team*.ti,ab.	1
69	(visit* adj2 (clinic* or consultant* or consultation* or service* or special*)).ti,ab.	9719
70	or/61-69	299133
71	schools/ or exp students/	101264
72	((mentor* or school* or teacher*) adj (based or deliver* or led or mediat* or operated or run or sector* or setting*)).ti,ab.	9027
73	((mentor* or school* or teacher*) adj3 (intervention* or program* or rehab* or therap* or service* or skill* or treat*)).ti,ab.	15762

74	((mentor* or pupil* or school* or teacher*) adj3 (advice* or advis* or aftercare or assist* or casework* or case work* or counsel* or educat* or integrat* or liaison* or mentor* or network* or reinforc* or reintegrat* or setting* or support* or visit*)).ti,ab.	25943
75	or/71-74	132435
76	charities/ or education, nonprofessional/ or friends/ or group processes/ or hotlines/ or peer group/ or exp psychotherapy, group/ or rehabilitation, vocational/ or self-help groups/ or voluntary workers/	77186
77	(befriend* or be*1 friend* or buddy or buddies or ((community or lay or paid or support) adj (person or worker*))).ti,ab.	1698
78	charit*.ti,ab.	4139
79	((consumer* or famil* or friend* or lay or mutual* or peer* or social* or voluntary or volunteer*) adj3 (advice* or advis* or counsel* or educat* or forum* or help* or mentor* or network* or support* or visit*)).ti,ab.	71289
80	((consumer* or famil* or peer* or self help or social* or support* or voluntary or volunteer*) adj2 group*).ti,ab.	24096
81	((consumer* or famil* or friend* or lay or mutual* or peer* or self help or social* or voluntary or volunteer*) adj3 (intervention* or program* or rehab* or therap* or service* or skill* or treat*)).ti,ab.	59603
82	(((consumer* or famil* or friend* or lay* or peer* or user* or voluntary or volunteer*) adj (based or counsel* or deliver* or interact* or led or mediat* or operated or provides or provider* or run*)) or voluntary work*).ti,ab.	13786
83	((consumer* or famil* or friend* or lay* or peer* or relation* or support*) adj3 trust*).ti,ab.	2060
84	(coping adj (behavio* or skill*)).ti,ab.	3063
85	((emotion* adj (focus* or friend* or relation*)) or ((dyadic or loneliness or psychosocial* or psycho social*) adj2 (assist* or counsel* or intervention* or program* or support* or therap* or treat*)) or ((emotion* or one to one or transition*) adj support*) or (lay adj (led or run))).ti,ab.	12311
86	((emotion* or network* or organi?ation* or peer*) adj2 support*).ti,ab.	11569
87	(group*1 adj2 (advocacy or approach* or assist* or coach* or counsel* or educat* or help* or instruct* or learn* or module* or network* or participat* or program* or psychotherap* or rehab* or skill* or strateg* or support* or teach* or train* or workshop* or work shop*)).ti,ab.	42604
88	((group* or network* or peer*1) adj2 (discuss* or exchang* or interact* or meeting*)).ti,ab.	24462
89	(groupwork or (group adj2 work)).ti,ab.	2706
90	(helpline or help line or ((phone* or telephone*) adj3 (help* or instruct* or interact* or interven* or mediat* or program* or rehab* or strateg* or support* or teach* or therap* or train* or treat* or workshop*)) or ((phone or telephone*) adj2 (assist* or based or driven or led or mediat*))).ti,ab.	6214
91	(helpseek* or ((search* or seek*) adj4 (care or assistance or counsel*	31908

	or healthcare or help* or support* or therap* or treat*))).ti,ab.	
92	(((lay or peer*) adj3 (advis* or consultant or educator* or expert* or facilitator* or instructor* or leader* or mentor* or person* or tutor* or worker*)) or expert patient* or mutual aid).ti,ab.	3714
93	(peer* adj3 (assist* or counsel* or educat* or program* or rehab* or service* or supervis*)).ti,ab.	3222
94	((psychoeducat* or psycho educat*) adj3 (group or network* or service*)).ti,ab.	456
95	((social or psychosocial) adj (adapt* or reintegrat* or support*)).ti,ab.	24478
96	(support* adj3 (approach* or educat* or instruct* or interven* or learn* or module* or network* or program* or psychotherap* or strateg* or technique* or therap* or train* or workshop* or work shop*)).ti,ab.	49807
97	supportive treatment*.ti,ab.	1840
98	(alcohol* anonymous or cocaine anonymous or narcotic* anonymous or recover inc or smart recovery or social interaction program* or (self management adj2 recovery training) or support* listening or supportive relationship* or schizophrenic* anonymous or visit* service* or (volunt* adj3 (aid* or support* or trained or work*))).ti,ab.	4346
99	or/76-98	351536
100	social skills/	46
101	(((psychosocial or social) adj3 skill*) or ((psychosocial or social) adj2 learn*) or ((psychosocial or social) adj3 competen*) or roleplay* or role play* or ((peer* or social* or psychosocial or support*) adj2 (group* or network*)) or ((group* or peer* or social* or psychosocial) adj2 (network* or support*))).ti,ab.	70284
102	or/100-101	70311
103	assisted living facilities/ or group homes/ or halfway houses/ or homeless persons/ or residential facilities/ or residential treatment/ or therapeutic community/	17063
104	(((accommod* or bedsit* or bed sit* or flats or flatlets or homeless* or hous* or home* or hostel* or hous* or landlord* or lodge* or rent or rents or rented or renting or residen* or room* or runaway* or tenant*) adj3 (appointment* or care or cluster* or coach* or communit* or healthcare or integrat* or independen* or intervention* or model* or outreach or place* or program* or rehab* or reintegrat* or satellite or scheme* or service* or staffed or supervis* or support* or therap* or treatment* or warden* or visit*)) or ((rent or rents or rented or renting) adj3 (accommod* or bedsit* or bed sit* or flats or flatlets or homeless* or hous* or home* or hostel* or hous* or landlord* or lodge* or residen* or room* or runaway* or tenant*)) or shelter*).ti,ab.	106565
105	((24 hour or day time or daytime or live in*1 or out of*1 hour*) adj (care or cover or healthcare or staff*)).ti,ab.	333
106	(((assist* or cooperative or co operative or independen* or staffed or supportive) adj2 (care or living)) or staff* model*).ti,ab.	16465
107	(board* adj2 care).ti,ab.	267

108	((concept or support) adj house).ti,ab.	8
109	((communit* or mental health) adj2 (living or place* or resettl* or residence*)).ti,ab.	3377
110	floating support.ti,ab.	4
111	(group adj (dwelling* or home*)).ti,ab.	697
112	(hous* adj2 (association* or officer* or resident*)).ti,ab.	2838
113	(place* adj3 (adult* or famil* or person*)).ti,ab.	3748
114	(resident* adj3 (continuum or facilit* or independen* or setting* or status)).ti,ab.	5121
115	psychosocial therap*.ti,ab.	254
116	single room.ti,ab.	238
117	supporting people program*.ti,ab.	0
118	((therapeutic adj2 community) or modified tc).ti,ab.	1160
119	or/103-118	143202
120	employment, supported/ or occupational health/ or occupational medicine/ or occupational therapy/ or rehabilitation, vocational/ or return to work/ or vocational education/ or work/ or (employment/ and rh.fs.)	77450
121	(club house* or clubhouse* or fountain house* or work therap*).ti,ab.	320
122	((employ* or job*1 or occupat* or reemploy* or vocation* or work*) adj3 (advice or advis* or assist* or coach* or counsel* or educat* or experience or integrat* or interven* or liaison* or placement* or program* or rehab* or reintegrat* or retrain* or scheme* or support* or service* or skill* or teach* or therap* or train* or transitional* or vocat*)).ti,ab.	95532
123	((individual placement adj2 support) or ips model).ti,ab.	138
124	((permitted or voluntary or rehab*) adj3 work*).ti,ab.	2150
125	((psychiatric or psychosocial or psycho social or social) adj2 rehab*).ti,ab.	2530
126	rehabilitation counsel*.ti,ab.	199
127	(vocat* adj3 (advice* or advis* or assist* or casework* or case work* or counsel* or educat* or integrat* or interven* or liaison* or mentor* or network* or program* or rehab* or reintegrat* or service* or setting* or skill* or support* or retrain* or teach* or therap* or train* or treat* or specialist*)).ti,ab.	4777
128	vocational outcome*.ti,ab.	215
129	or/120-128	159558
130	crisis intervention/	5213
131	(alternative* adj3 (hospital* or psychiatric care or ward*)).ti,ab.	1126
132	((crisis or crises or recover*) adj3 (hous* or lodge* or shelter*)).ti,ab.	264
133	((crisis or residential) adj2 alternative*).ti,ab.	110
134	((crisis resolution adj2 home treatment team*)).ti,ab.	11
135	crht*1.ti,ab.	13

136	(resident* and crisis).ti,ab.	469
137	or/130-136	7034
138	exp *activities of daily living/ or exp self care/ or exp *daily life activity/	56385
139	(assertiveness training or communication skills training).ti,ab.	669
140	((benefits* or bills or budget* or computer* or diet* or financ* or money or nutrition* or relationship*) adj3 (advice* or assist* or coach* or educat* or interven* or program* or skill* or support* or service* or teach* or tool*)).ti,ab.	96234
141	((healthy living adj (intervention* or program*)) or exercise program* or harm reduction program*).ti,ab.	7266
142	((advice* or assist* or coach* or educat* or interven* or program* or skill* or support* or service* or teach* or tool*) adj2 (living or life or social or self care or independen* or survival)).ti,ab.	65162
143	(transition* adj2 (adult* or support* or service*)).ti,ab.	1901
144	(independen* adj2 (live* or living)).ti,ab.	3894
145	or/138-144	221875
146	"early intervention (education)"/	1895
147	(early adj (intervent* or treat* or recogni* or detect*)).ti,ab.	67333
148	or/146-147	68672
149	exp hepatitis/ or exp hiv/ or exp hiv infections/ or exp tuberculosis/	535079
150	((((acquired immunodeficiency or acquired immuno deficiency or human immuno deficiency or human immune deficiency or human immunodeficiency or immunodeficiency or lymphadenopathy) adj2 (retrovirus or syndrome* or virus)) or aids or (blood adj2 borne) or drtb or hepatitis or hiv or mdrtb or tuberculosis or xdrtb) adj3 (referral* or screen* or test*)).ti,ab.	27343
151	exp mass screening/ or exp population surveillance/ or "referral and consultation"/	201682
152	((((acquired immunodeficiency or acquired immuno deficiency or human immuno deficiency or human immune deficiency or human immunodeficiency or immunodeficiency or lymphadenopathy) adj2 (retrovirus or syndrome* or virus)) or aids or (blood adj2 borne) or drtb or hepatitis or hiv or mdrtb or tuberculosis or xdrtb) adj3 (educat* or disinfect* or empower* or knowledge or information* or instruct* or intervention* or promot* or psychoeducat* or psycho educat* or teach* or train* or book*1 or booklet* or brochure* or leaflet* or manual*1 or material* or multimedia or multi media or pamphlet* or poster* or program* or resource or service or scheme* or sterilis* or steriliz* or system* or workbook* or ((oral or printed or written) adj3 inform*) or video* or screen* or test* or diagnos* or prevent* or detect* or referral*)).ti,ab.	93444
153	needle exchange programs/	1360
154	(((needle* or syring*) adj2 exchang* adj2 program*) or (supervis* adj2 inject* adj2 (cent* or facilit* or service* or setting* or unit*))).ti,ab.	959
155	(149 and 151) or (or/150,152-154)	102566

156	(addiction health service or (addiction adj (team* or unit*)) or community drugs service or daat or (drug adj2 (alcohol treatment agenc* or drug treatment cent*)) or ((liaison or local or rehab*) adj (program* or service* or worker*)) or ((rehabilitation or treatment*) adj (center* or centre* or clinic* or facility* or organi?ation* or program* or service*)) or mobile clinic*).ti,ab.	42779
157	(dual diagnosis adj2 (agenc* or care or center* or centre* or clinic* or intervention* or program* or service* or team* or treatment* or worker*)).ti,ab.	174
158	((augment* or collaborat* or coordinat* or co ordinat* or enhanc* or holistic* or integrat* or interdisciplin* or inter disciplin* or interagenc* or inter agenc* or interorganis* or inter organis* or interprofessional* or inter professional* or intraprofessional* or intra professional* or multiagenc* or multi agenc* or multidimension* or multi dimension* or multidisciplin* or multi disciplin* or multifacet* or multi facet* or multiprofessional* or multi professional* or multiple or shared or stepped or tiered or transdisciplin* or trans discliplin*) adj3 (approach* or care or healthcare or intervention* or manag* or model* or program* or psychotherap* or service* or system* or team* or therap* or treatment* or work*)).ti,ab.	247037
159	or/37,51,54,60,70,75,99,102,119,129,137,145,148,155-158	2105917
160	epidemiology/ or incidence/ or prevalence/ or morbidity/	393675
161	(incidence or prevalen* or occurrence* or morbidity).ti,ab.	1254139
162	or/160-161	1388570
163	health surveys/ or health care surveys/ or questionnaires/	369267
164	(question* or survey*).ti,ab.	854494
165	or/163-164	985611
166	(comment* or editorial* or historical article or letter).pt.	1584485
167	exp animals/ not humans/	3987626
168	or/166-167	5511929
169	34 and 159 and 162	5070
170	169 not 168	5034
171	limit 170 to english language	4632
172	limit 171 to yr="2000 -current"	3421
173	34 and 159 and 165	5252
174	173 not 168	5239
175	limit 174 to english language	4858
176	limit 175 to yr="2000 -current"	3831

APPENDIX 2. EXAMPLE COMPLETED QUALITY APPRAISAL CHECKLIST FOR RQ 1.1

NEWCASTLE - OTTAWA QUALITY ASSESSMENT SCALE
CASE CONTROL STUDIES

Study example: Boys et al. (2003)

Note: A study can be awarded a maximum of one star for each numbered item within the Selection and Exposure categories. A maximum of two stars can be given for Comparability.

Selection

1) Is the case definition adequate?
   a) yes, with independent validation ✵
   b) yes, eg record linkage or based on self reports✓
   c) no description

2) Representativeness of the cases
   a) consecutive or obviously representative series of cases ✵✓
   b) potential for selection biases or not stated

3) Selection of Controls
   a) community controls ✵✓
   b) hospital controls
   c) no description

4) Definition of Controls
   a) no history of disease (endpoint) ✵
   b) no description of source✓

Comparability

1) Comparability of cases and controls on the basis of the design or analysis
   a) study controls for setting/sampling frame ✵
   b) study controls for any additional factor ✵ ✓ (Controls for background and family variables (no further detail reported))

Exposure

1) Ascertainment of exposure
   a) secure record (eg surgical records) ✵
   b) structured interview where blind to case/control status ✵✓
   c) interview not blinded to case/control status
   d) written self report or medical record only
   e) no description

2) Same method of ascertainment for cases and controls
   a) yes ✵✓
   b) no

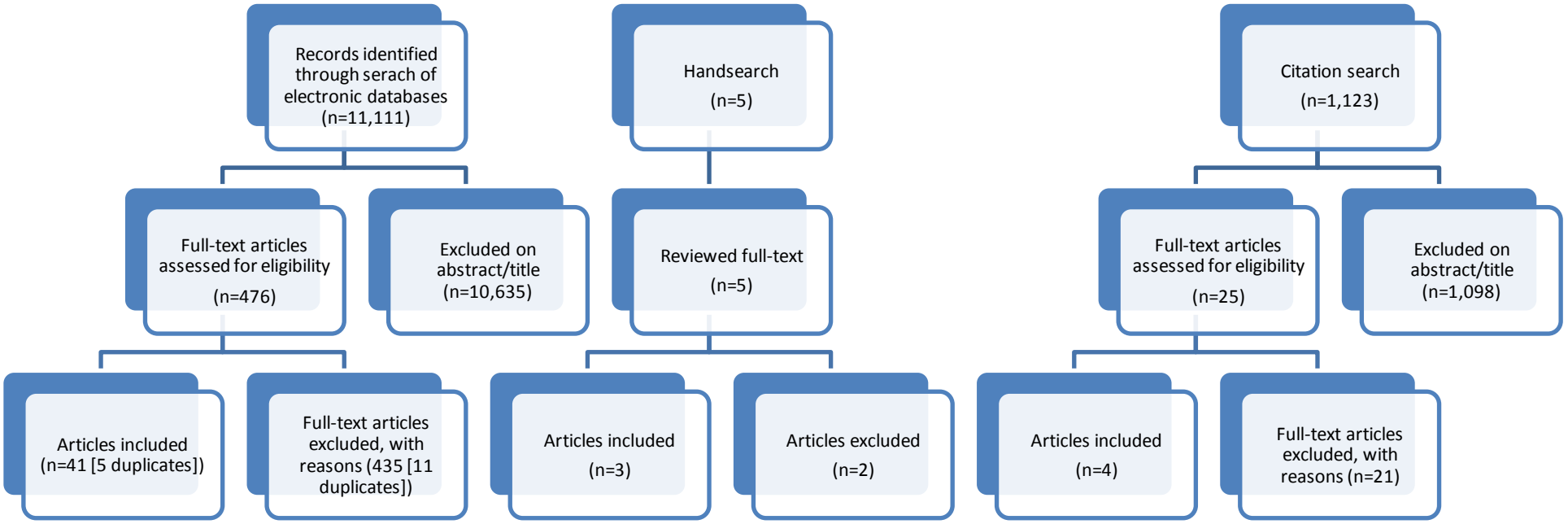
3) Non-Response rate
   a) same rate for both groups ✵✓
   b) non respondents described
   c) rate different and no designation

APPENDIX 3. EXAMPLE COMPLETED QUALITY APPRAISAL CHECKLIST FOR RQ 1.2

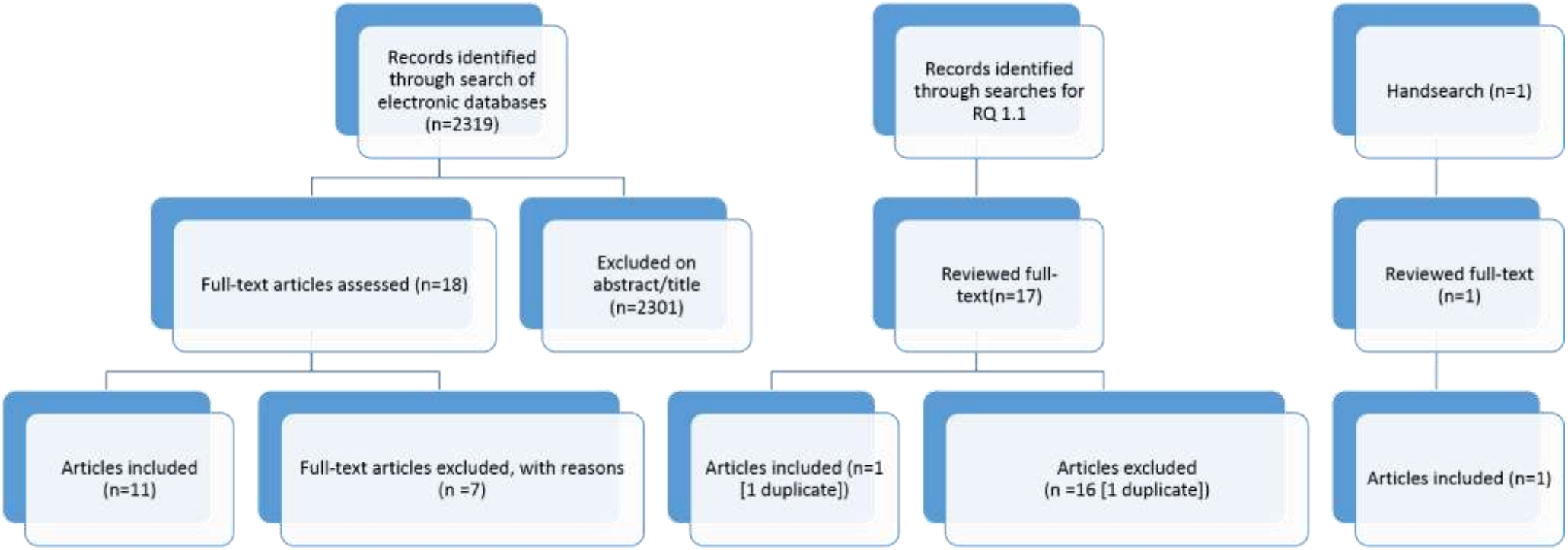
Study identification Manley 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26.		
Guidance topic: Dual Diagnosis	Question no: 1.2	
Checklist completed by: EM		
	Yes/ Partly/ No/ Unclear /NA	Comments
Authority		
Does the report identify who is responsible for the intellectual content?	Yes	
Are they reputable?	Yes	Nurse consultant in dual diagnosis
Accuracy		
Does the item have a clearly stated aim of brief?	Yes	
Does it have a stated methodology?	No	Introduction and description of services only
Has it been peer-reviewed?	Yes	
Has it been edited by a reputable authority?	Yes	
Coverage		
Are any limits clearly stated?	No	Only limits to described services provided
Objectivity		
Is the author's standpoint clear?	Yes	
Does the work seem to be balanced in presentation?	No	The work is not based on objective data, so presentation may be biased.
Date		
Does the item have a clearly stated date of content?	Yes	
Significance		
Is the item meaningful?	Yes	Provides good description of services

Does it add context?	Yes	
Does it strengthen or refute a current position?	Unclear	Current position on configuration of UK dual diagnosis services is unclear
Would the research area be lesser without it?	Unclear	
Other comments:		

APPENDIX 4. PRISMA DIAGRAM – RQ 1.1



APPENDIX 5. PRISMA DIAGRAM – RQ 1.2



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APPENDIX 7. BIBLIOGRAPHY OF EXCLUDED STUDIES FOR RQ 1.1

	Study	Reason for exclusion
1.	Aakre JM, Brown CH, Benson KM, Drapalski AL, Gearon JS. Trauma exposure and PTSD in women with schizophrenia and coexisting substance use disorders: comparisons to women with severe depression and substance use disorders. Psychiatry Research. 2014;220:840-45.	Context outside scope: Non-UK study
2.	Abdul-Hamid WK, Wykes T, Stansfeld S. Needs of homeless people for mental healthcare. The Psychiatrist. 2010;34:334-37.	Population outside scope: People with a SMI but no evidence of substance misuse
3.	Addington J, Addington D. Patterns, predictors and impact of substance use in early psychosis: a longitudinal study. Acta Psychiatrica Scandinavica. 2007;115:304-09.	Context outside scope: Non-UK study
4.	Agosti V, Levin FR. One-year follow-up study of suicide attempters treated for drug dependence. The American Journal on Addictions. 2006;15:293-96.	Context outside scope: Non-UK study
5.	Ahmadi J, Toobaee S, Kharras M, Radmehr M. Psychiatric disorders in opioid dependants. International Journal of Social Psychiatry. 2003;49:185-91.	Context outside scope: Non-UK study
6.	Ahmadi J, Majdi B, Mahdavi S, Mohagheghzadeh M. Mood disorders in opioid-dependent patients. Journal of Affective Disorders. 2004;82:139-42.	Context outside scope: Non-UK study
7.	Akindipe T, Wilson D, Stein DJ. Psychiatric disorders in individuals with methamphetamine dependence: prevalence and risk factors. Metabolic Brain Disease. 2014;29:351-57.	Context outside scope: Non-UK study
8.	Arch JJ, Craske MG, Stein MB, Sherbourne CD, Roy-Byrne PP. Correlates of alcohol use among anxious and depressed primary care patients. General Hospital Psychiatry. 2006;28:37-42.	Context outside scope: Non-UK study
9.	Archie S, Rush BR, Akhtar-Danesh N, Norman R, Malla A, Roy P et al. Substance use and abuse in first-episode psychosis: prevalence before and after early intervention. Schizophrenia Bulletin. 2007;33:1354-63.	Context outside scope: Non-UK study
10.	Arseneault L, Moffitt TE, Caspi A, Taylor A. The targets of violence committed by young offenders with alcohol dependence, marijuana	Context outside scope: Non-UK study

	dependence and schizophrenia-spectrum disorders: findings from a birth cohort. Criminal Behaviour & Mental Health. 2002;12:155-68.	
11.	Arseneault L, Cannon M, Poulton R, Murray R, Caspi A, Moffitt TE. Cannabis use in adolescence and risk for adult psychosis: longitudinal prospective study. The British Medical Journal. 2002;325:1212-13.	Context outside scope: Non-UK study
12.	Arya KR, Pawar A. Profile of substance-using women presenting to a tertiary care de-addiction facility. Indian Journal of Psychiatry. 2013;55:79.	Context outside scope: Non-UK study
13.	Astals M, Díaz L, Domingo-Salvany A, Martín-Santos R, Bulbena A, Torrens M. Impact of co-occurring psychiatric disorders on retention in a methadone maintenance program: an 18-month follow-up study. International Journal of Environmental Research & Public Health. 2009;6:2822-32.	Context outside scope: Non-UK study
14.	Austin SF, Hjorthoj CR, Mors O, Secher RG, Bertelsen M, Jensen H, et al. Persistent negative symptoms in first episode psychosis: predictors and outcomes at 10-year follow-up. Early Intervention in Psychiatry. 2014;8:55.	Conference abstract and not published in full
15.	Baethge C, Baldessarini RJ, Khalsa HMK, Hennen J, Salvatore P, Tohen M. Substance abuse in first-episode bipolar I disorder: indications for early intervention. American Journal of Psychiatry. 2005;162:1008-10.	Context outside scope: Non-UK study
16.	Bahorik AL, Newhill CE, Queen CC, Eack SM. Under-reporting of drug use among individuals with schizophrenia: prevalence and predictors. Psychological Medicine. 2014;44:61-69.	Context outside scope: Non-UK study
17.	Bailey LJ, Sheehy RJ. The state of residential care for people with mental illness; insights from an audit of the screening tool for entry to licensed residential facilities. Australian & New Zealand Journal of Public Health. 2009;33:140-43.	Context outside scope: Non-UK study
18.	Bailey K, Webster R, Baker AL, Kavanagh DJ. Exposure to dysfunctional parenting and trauma events and posttraumatic stress profiles among a treatment sample with coexisting depression and alcohol use problems. Drug & Alcohol Review. 2012;31:529-37.	Context outside scope: Non-UK study
19.	Baker KD, Lubman DI, Cosgrave EM, Killackey EJ, Yuen HP, Hides L. et al. Impact of co-occurring substance use on 6 month outcomes for young people seeking mental health treatment. Australian & New Zealand	Context outside scope: Non-UK study

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21.	Banerjea R, Pogach LM, Smelson D, Sambamoorthi U. Mental illness and substance use disorders among women veterans with diabetes. Womens Health Issues. 2009;19:446-56.	Context outside scope: Non-UK study
22.	Barnes TR, Mutsatsa SH, Hutton SB, Watt HC, Joyce EM. Comorbid substance use and age at onset of schizophrenia. The British Journal of Psychiatry. 2006;188:237-42.	Setting outside scope: People with dual diagnosis who are not living in the community
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32.	Biegel DE, Stevenson LD, Beimers D, Ronis RJ, Boyle P. Predictors of competitive employment among consumers with co-occurring mental and substance use disorders. Research on Social Work Practice. 2010;20:191-201	Context outside scope: Non-UK study
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34.	Bishop TM, Prince MA, Krenek M, Maisto SA. Age and presence of alcohol as predictors of sexual behavior among dually diagnosed individuals. Alcoholism: Clinical and Experimental Research. 2011;35:223A.	Conference abstract and not published in full
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48.	Bukstein OG, Cornelius JR, Kelly TM, Wood DS. Bipolar disorder in a population of adolescents with alcohol use disorders. Journal of Dual Diagnosis. 2006;2:59-72	Context outside scope: Non-UK study
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52.	Callaly T, Trauer T, Munro L, Whelan G. Prevalence of psychiatric disorder in a methadone maintenance population. Australian & New Zealand Journal of Psychiatry. 2001;35:601-05.	Context outside scope: Non-UK study
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79.	Coid J, Petruckevitch A, Chung WS, Richardson J, Moorey S, Feder G. Abusive experiences and psychiatric morbidity in women primary care	Condition outside scope: SMI and substance misuse data reported but not for dual

	attenders. British Journal of Psychiatry. 2003;183:332-39.	diagnosis
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86.	Conus P, Cotton S, Abdel-Baki A, Lambert M, Berk M, McGorry PD. Symptomatic and functional outcome 12 months after a first episode of psychotic mania: barriers to recovery in a catchment area sample. Bipolar Disorders. 2006;8:221-31.	Context outside scope: Non-UK study
87.	Conus P, Cotton S, Schimmelmann BG, McGorry PD, Lambert M. The First-Episode Psychosis Outcome Study: Premorbid and baseline characteristics of an epidemiological cohort of 661 first-episode psychosis patients. Early Intervention in Psychiatry. 2007;1:191-200.	Context outside scope: Non-UK study
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APPENDIX 8. BIBLIOGRAPHY OF INCLUDED STUDIES FOR RQ 1.2

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Swinden D, Barrett M. Developing a dual diagnosis role within mental health. Nursing Times. 2008;104:26-27.

Trippier J, Parker S. Reflections on the role of the specialist dual diagnosis clinician. Advances in Dual Diagnosis. 2008;1:14-19.

APPENDIX 9. BIBLIOGRAPHY OF EXCLUDED STUDIES FOR RQ 1.2

	Study	Reason for exclusion
1.	Alvidrez J, Havassy BE. Clinical characteristics and service utilization patterns of clients with schizophrenia-spectrum disorder in public residential detoxification settings. Community Mental Health Journal. 2006;42:131-42.	Context outside scope: Non-UK study
2.	Brousselle A, Lamothe L, Mercier C, Perreault M. Beyond the limitations of best practices: how logic analysis helped reinterpret dual diagnosis guidelines. Evaluation and Program Planning. 2007;30:94-104.	Context outside scope: Non-UK study
3.	Byrne P. Early intervention in an inner city general hospital: treating the damage from alcohol and substance misuse. Early Intervention in Psychiatry. 2014;8:93.	Conference abstract and not published in full
4.	Cheng TC, Lo CC. Mental health service and drug treatment utilization: adolescents with substance use/mental disorders and dual diagnosis. Journal of Child and Adolescent Substance Abuse. 2010;19:447-60.	Context outside scope: Non-UK study
5.	Clark HW, Power AK, Le Fauve CE, Lopez EI. Policy and practice implications of epidemiological surveys on co-occurring mental and substance use disorders. Journal of Substance Abuse Treatment. 2008;34:3-13.	Context outside scope: Non-UK study
6.	Eaton L. Mental Health. Double troubles. The Health Service Journal. 2007;117:22-24.	Not primary data
7.	Hughes E. Service provider response to mental health and alcohol in the North West Region of England: a scoping exercise. Advances in Dual Diagnosis. 2011;4:141-51.	Does not describe a service
8.	Knudsen HK, Roman PM, Ducharme LJ. The availability of psychiatric programs in private substance abuse treatment centers, 1995 to 2001. Psychiatric Services. 2004;55:270-73.	Context outside scope: Non-UK study
9.	Laudet AB, Magura S, Cleland CM, Vogel HS, Knight EL. Predictors of retention in dual-focus self-help groups. Community Mental Health Journal. 2003;39:281-97.	Context outside scope: Non-UK study
10.	Lichtenstein DP, Spirito A, Zimmermann RP. Assessing and treating co-	Context outside scope: Non-UK study

	occurring disorders in adolescents: examining typical practice of community-based mental health and substance use treatment providers. Community Mental Health Journal. 2010;46:252-57.	
11.	Mallin R, Slott K, Tumblin M, Hunter M. Detection of substance use disorders in patients presenting with depression. Substance Abuse. 2002;23:115-20.	Context outside scope: Non-UK study
12.	Neumiller S, Bennett-Clark F, Young MS, Dates B, Broner N, Leddy J, et al. Implementing assertive community treatment in diverse settings for people who are homeless with co-occurring mental and addictive disorders: a series of case studies. Journal of Dual Diagnosis. 2009;5:239-63.	Context outside scope: Non-UK study
13.	Priebe S, Fakhoury W, Watts J, Bebbington P, Burns TOM, Johnson S, et al. Assertive outreach teams in London: patient characteristics and outcomes. Pan-London Assertive Outreach Study, part 3. The British Journal of Psychiatry. 2003;183:148-54.	Does not describe a service
14.	Pringle JL, Emptage NP, Hubbard RL. Unmet needs for comprehensive services in outpatient addiction treatment. Journal of Substance Abuse Treatment. 2006;30:183-89.	Context outside scope: Non-UK study
15.	Roush S. Starting a dual diagnosis anonymous meeting: the role of the clinician. Journal of Dual Diagnosis. 2008;4:158-69.	Context outside scope: Non-UK study
16.	Schulte SJ, Meier PS, Stirling J. Dual diagnosis clients' treatment satisfaction - a systematic review. BMC Psychiatry. 2011;11:64.	Does not describe a service
17.	Schulte SJ, Meier PS, Stirling J, Berry M. Treatment approaches for dual diagnosis clients in England. Drug and Alcohol Review. 2008;27:650-58.	Does not describe a service
18.	Schulte SJ, Meier PS, Stirling J, Berry M. Dual diagnosis competency among addiction treatment staff: training levels, training needs and the link to retention. European Addiction Research. 2010;16:78-84.	Does not describe a service
19.	Summers A, Goel C. Substance use in early intervention services for psychosis. Advances in Dual Diagnosis. 2011;4:115-24.	Outcomes reported are outside scope
20.	Todd J, Green G, Harrison M, Ikuesan BA, Self C, Baldacchino A, et al. Defining dual diagnosis of mental illness and substance misuse: some methodological issues. Journal of Psychiatric and Mental Health Nursing. 2004b;11:48-54.	Does not describe a service
21.	Torrens M, Rossi PC, Martinez-Riera R, Martinez-Sanvisens D, Bulbena	Non-systematic review

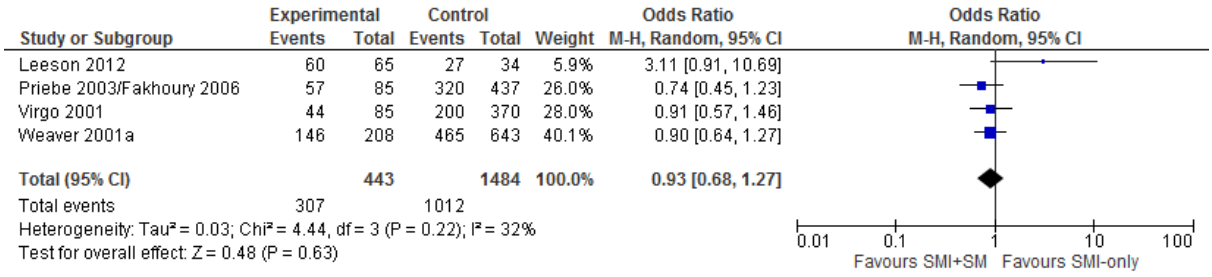
	A. Psychiatric co-morbidity and substance use disorders: treatment in parallel systems or in one integrated system? Substance Use and Misuse. 2012;47:1005-14.	
22.	Winstanley EL, Steinwachs DM, Stitzer ML, Fishman MJ. Adolescent substance abuse and mental health: problem co-occurrence and access to services. Journal of Child and Adolescent Substance Abuse. 2012;21:310-22.	Context outside scope: Non-UK study

APPENDIX 10. FOREST PLOTS FOR META-ANALYSES

Comparison 1: Severe mental illness and substance misuse versus severe mental illness-only

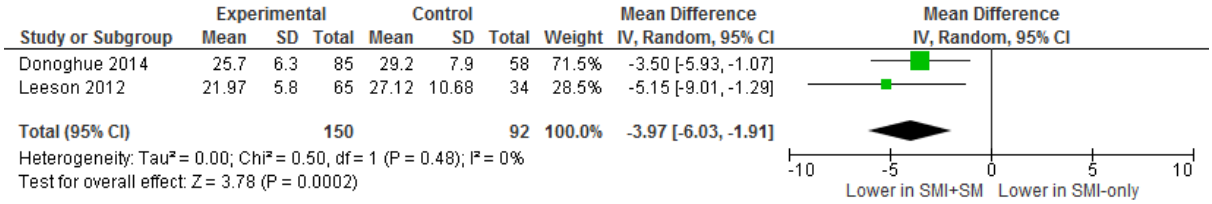
1. Prevalence of dual diagnosis

Forest plot 1.1: Diagnosis of schizophrenia

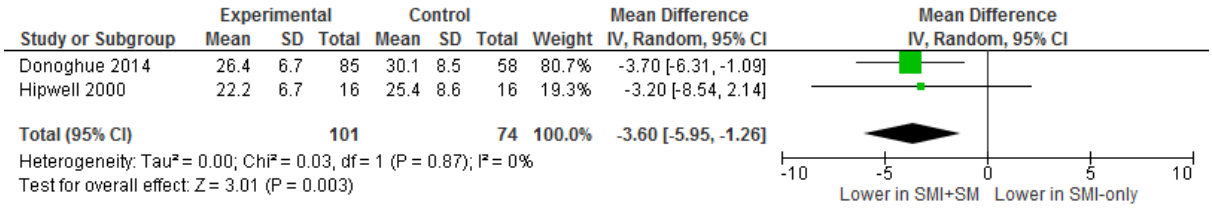


2. Age variation

Forest plot 2.1: Age at psychosis onset

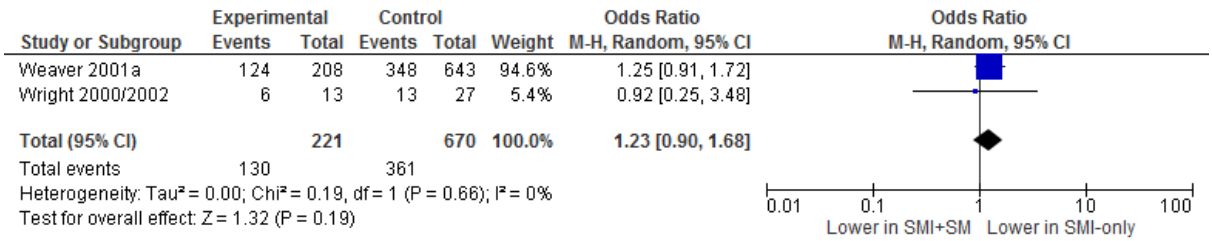


Forest plot 2.2: Age at first mental health contact



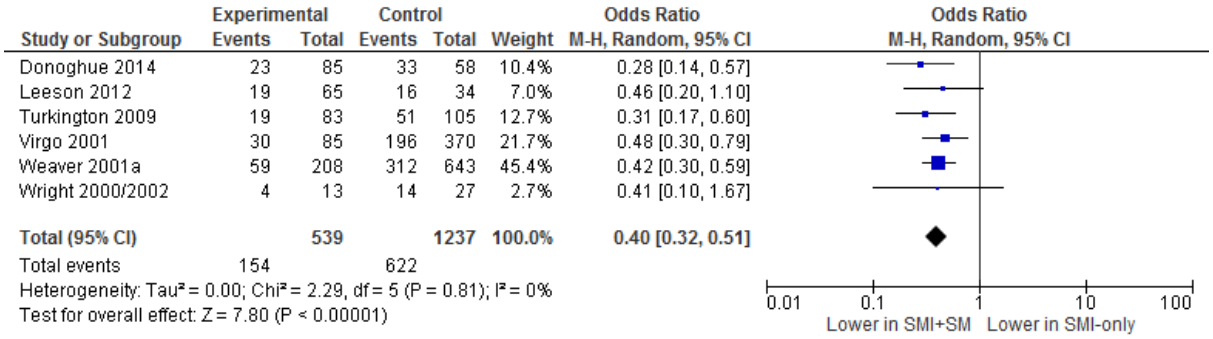
3. Ethnic variation

Forest plot 3.1: Number of white participants



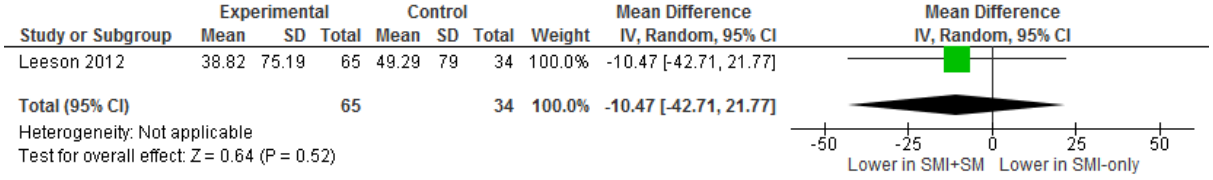
4. Gender variation

Forest plot 4.1: Number of females



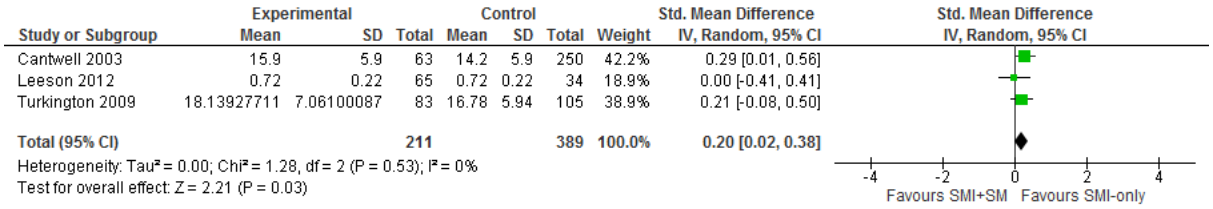
5. Symptom duration

Forest plot 5.1: Duration of untreated psychosis (weeks)

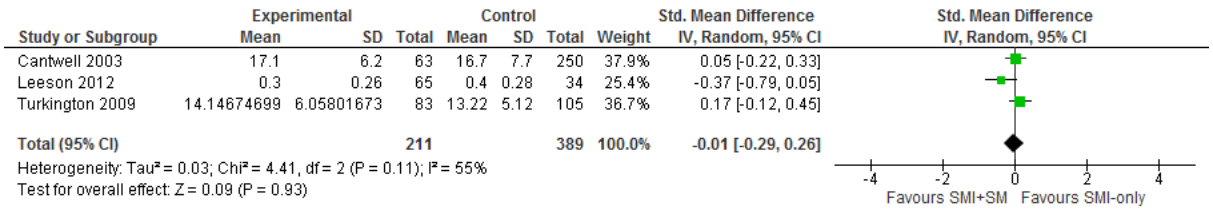


6. Symptom severity

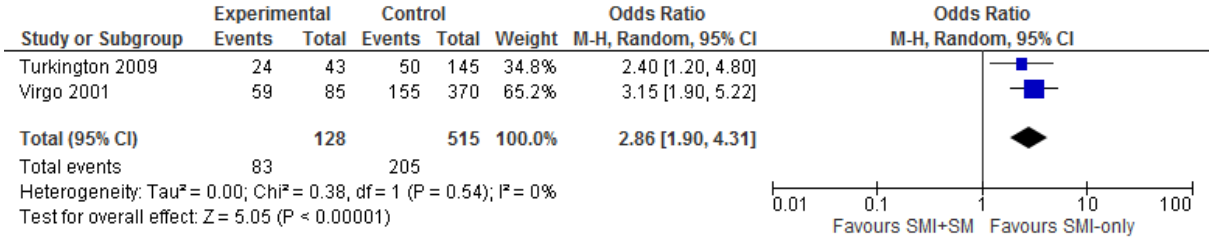
Forest plot 6.1: Positive symptoms (PANSS/SAPS/SAPNS)



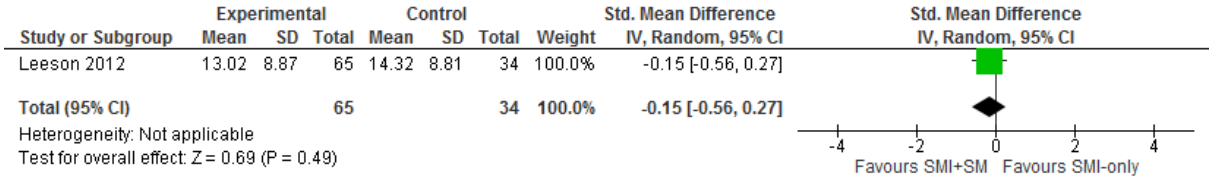
Forest plot 6.2: Negative symptoms (PANSS/SANS/SAPNS)



Forest plot 6.3: Relapse/non-remission

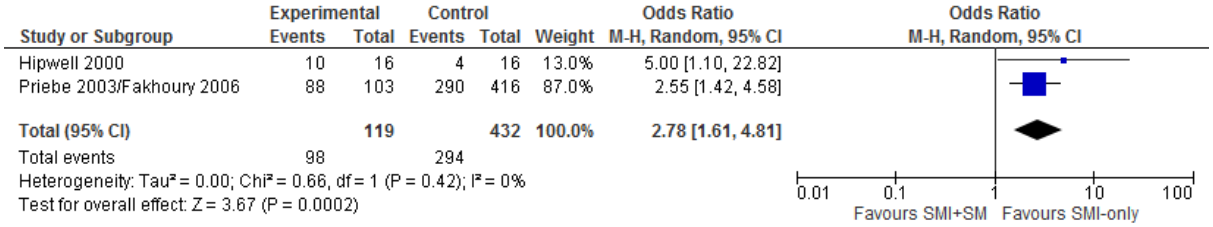


Forest plot 6.4: Depression symptoms (CDS/HRSD)



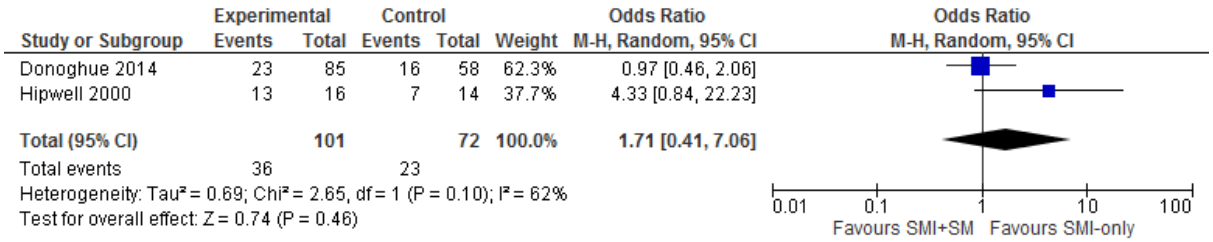
7. Prevalence of health care needs

Forest plot 7.1: Service utilisation: Admission as an inpatient in past 1-2 years

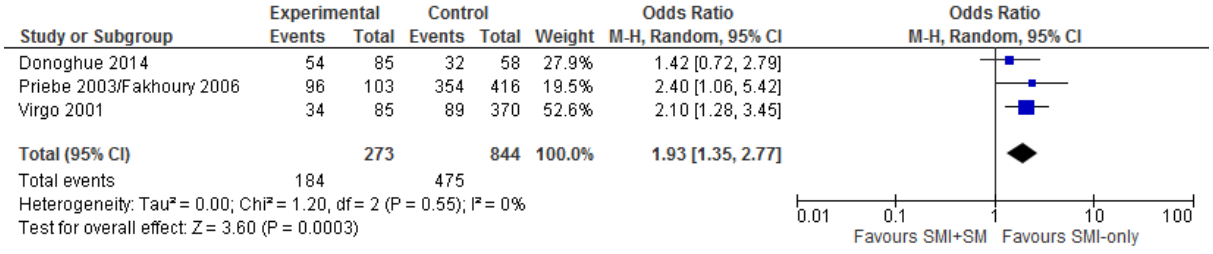


8. Prevalence of social care needs

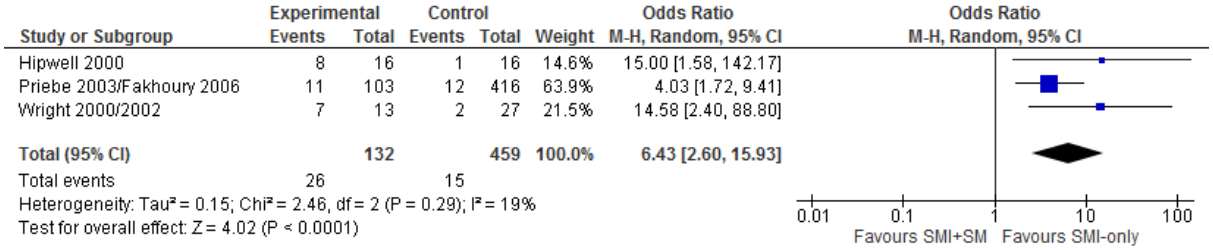
Forest plot 8.1: Education: No educational qualifications



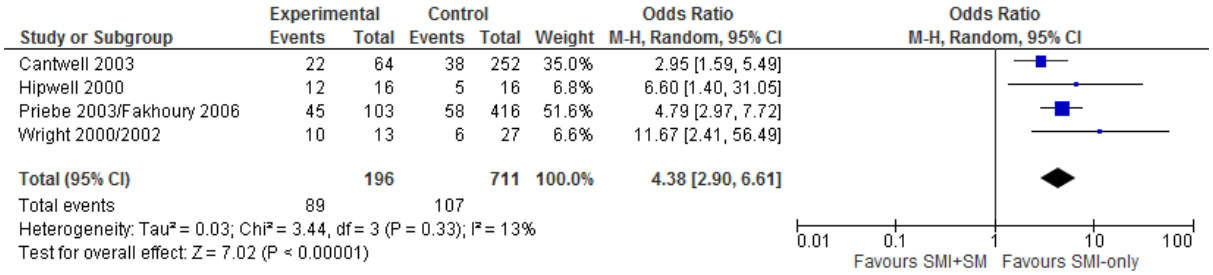
Forest plot 8.2: Employment: Unemployed



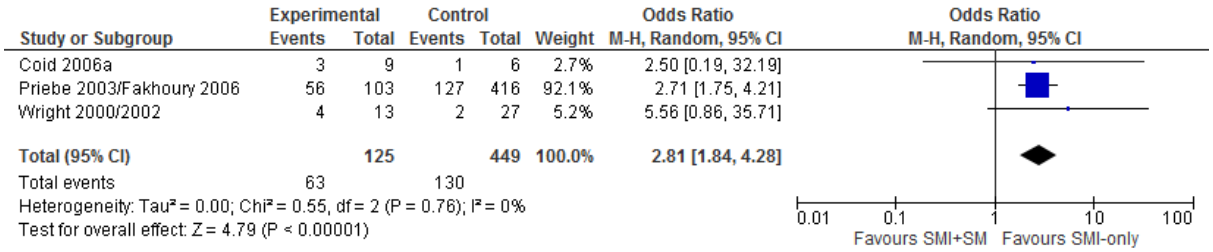
Forest plot 8.3: Housing: History of homelessness/problems with housing



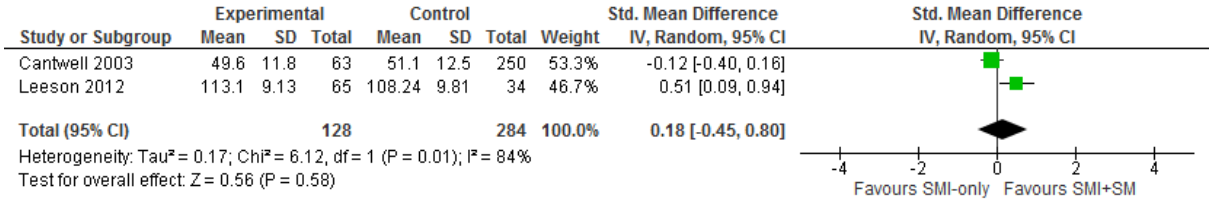
Forest plot 8.4: Contact with criminal justice system



Forest plot 8.5: Violence



Forest plot 8.6: Social functioning



APPENDIX 11. EVIDENCE TABLES: RQ1.1 EPIDEMIOLOGY

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Afuwape et al. 2006 [COMO study] Afuwape SA, Johnson S, Craig TJ, Miles H, Leese M, Mohan R, Thornicroft G. Ethnic differences among a community cohort of individuals with dual diagnosis in South London. Journal of Mental Health. 2006; 15:551-67. Cohort (+)	Participants were included if they: (1) were on the caseload of one of 13 community mental health teams (CMHTs) across the four adjacent South London boroughs of Lambeth, Southwark, Lewisham and Croydon; (2) had a recently documented (in case notes) diagnosis of psychotic illness (including schizophrenia, schizoaffective disorder, bipolar affective disorder with psychotic symptoms and delusional disorder); (3) received ratings of substance abuse, dependence or dependence with institutionalization over the previous 6 months based on the Alcohol Use Scale (AUS) and Drug Use Scale (DUS) (Drake et al., 1990) which were completed by case managers based on their direct knowledge and on clinical case notes; (4) were black or white as categorized using the UK Commission for Racial Equality's (CRE) self-rated categories London (south); Urban N: 1432 Data collected: 1999-2000 Secondary mental health care; Caseloads of CMHTs	Prevalence of dual diagnosis: Diagnosis of psychosis (from clinical case notes) and rating of substance abuse, dependence or dependence with institutionalization based on Alcohol Use Scale (AUS) and Drug Use Scale (DUS) (Drake et al., 1990) (rated by CMHT case manager [psychiatric social worker, mental health nurse or occupational therapist]) Characteristics of dual diagnosis: Clinician's Alcohol Use Scale (AUS): Abusing alcohol (rated by CMHT case manager); Alcohol Use Disorders Identification Test (AUDIT): Alcohol used in 30 days prior to interview and mean score (number of items and min/max score range NR; lower better; self-report); Maudsley Addiction Profile (MAP): Mean monthly consumption of alcohol (units)/ Mean price of monthly cannabis use (£) (self-report); Clinician's Drug Use Scale (DUS): Abusing cannabis/ Abusing cocaine/crack (rated by CMHT case manager); Drug Abuse Screening Test (DAST): Cannabis used in 30 days prior to interview (self-report); Diagnosis of schizophrenia/ bipolar affective disorder (from clinical case notes) Prevalence of health and social care needs: Camberwell Assessment of Needs Short Assessment Schedule (CANSAS): Mean score (number of items and	Prevalence of dual diagnosis (across ethnic groups): *14.87%* (213/1432) Characteristics of dual diagnosis *(% of dual diagnosis sample; calculated across ethnic groups*): *71.83% (153/213)* abusing alcohol *80.14% (117/146)* alcohol used in 30 days prior to interview Mean monthly consumption of alcohol (units): *176.04 (sd=388.45)* AUDIT mean score: *12.18 (sd=9.74)* *53.99% (115/213)* abusing cannabis *35.62% (52/146)* cannabis used in 30 days prior to interview Mean price of monthly cannabis use (£): *37.21 (sd=94.07)* *23% (49/213)* abusing cocaine/crack *72.3% (154/213)* diagnosis of schizophrenia *10.33% (22/213)* diagnosis of bipolar affective disorder Health and social care needs: CANSAS mean score (*calculated across ethnic groups*): *3.36 (sd=4.19)* Health care needs (% of dual diagnosis sample; *calculated*	Identified by authors: (1) Initial dual diagnosis ratings were made by case managers based on case notes and on their direct experience of the client and there may have been substantial differences in case managers' knowledge and recall regarding their clients' substance use, and such problems may also limit the validity of data supplied by case managers on adverse events such as violence (2) Non-response limits the validity of data from clients, especially as the response rate for black clients was lower Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on staff ratings of substance misuse and health and social needs with no objective confirmation (3) Diagnosis of SMI taken from case notes

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	SMI method of assessment: Diagnosis of psychosis (from clinical case notes) Substance misuse method of assessment; timescale: Rating of substance abuse, dependence or dependence with institutionalization based on Alcohol Use Scale (AUS) and Drug Use Scale (DUS) (Drake et al., 1990); 6 months Age (years): Range NR (mean: 37.5) Gender (% female): 16 Ethnicity (% white): 55	min/max score range NR; lower better; rated by CMHT case manager); Treatment Perceptions Questionnaire (TPQ): Mean score (number of items and min/max score range NR; higher better; self-report); Client Satisfaction Questionnaire (CSQ): Mean score (number of items and min/max score range NR; higher better; self-report) Prevalence of health care needs: Study-specific Socio-demographic Schedule (SDS): First contact with mental health (MH) services less than 2 years/ First contact with MH services 2-5 years/ First contact with MH services more than 5 years (self-report); Study-specific Clinical and Social History Schedule (CSHS; rated by CMHT case manager): Hospital admissions in previous 18 months; Mean length of stay for all admissions over 18 months (in days); Detention under the Mental Health Act for any admission in past 18 months Prevalence of social care needs: Employment (study-specific Socio-demographic Schedule [SDS; self-report]: Number unemployed); Education (study-specific SDS [self-report]: Number with no qualifications); Housing (SDS [self-report]: Number homeless); Contact with criminal justice system (Client Service Receipt Inventory [CSRI; self-report]: Police contact as perpetrator/victim or witness in 6 months prior to interview; Study-specific Clinical and Social History Schedule [CSHS]: Case-manager reported assaults and violent incidents in previous 18 months)	*across ethnic groups*): Service utilisation: *11.43% (24/210)* first contact with MH services less than 2 years; *16.19% (34/210)* first contact with MH services 2-5 years; *72.38% (152/210)* first contact with MH services more than 5 years *57.55% (122/212)* hospital admissions in previous 18 months *30.52% (65/213)* detention under the Mental Health Act for any admission in past 18 months Mean length of stay for all admissions over 18 months: *85.95 (sd=163.58)* Treatment perceptions mean score: *21.32 (sd=6.69)* Client satisfaction mean score: *22.45 (sd=5.73)* Social care needs (% of dual diagnosis sample; *calculated across ethnic groups*): *90.52% (191/211)* unemployed *56.99% (110/193)* no qualifications *6.64% (14/211)* homeless *21.6% (46/213)* police contact as perpetrator *11.74% (25/213)* police contact as victim/witness *35.21% (75/213)* case-manager reported assaults and violent incidents Ethnic variation *(combined Black Caribbean, Black African and Black British groups into one group and compared White and Black groups using the Mantel-Haenszel method*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			for dichotomous outcomes or the inverse variance method for continuous outcomes): *Statistically significant differences, with higher rates in Black group (versus White group):* Prevalence of dual diagnosis (118/894 White group; *95/538 Black group; OR 0.71 [0.53, 0.95]; p=0.02*) Abusing cannabis (42/118 White group; *73/95 Black group; OR 0.17 [0.09, 0.31]; p<0.00001*) First contact with MH services less than 2 years (7/115 White group; *17/95 Black group; OR 0.30 [0.12, 0.75]; p=0.01*) Detention under the Mental Health Act for any admission in past 18 months (28/118 White group; *37/95 Black group; OR 0.49 [0.27, 0.88]; p=0.02*) Case-manager reported assaults and violent incidents (32/118 White group; *43/95 Black group; OR 0.45 [0.25, 0.80]; p=0.006*) *Statistically significant differences, with higher rates in White group (versus Black group):* Abusing alcohol (101/118 White group; *52/ 95 Black group; OR 4.91 [2.56, 9.44]; p<0.00001*) Alcohol used in 30 days prior to interview (75/87 White group; *42/59 Black group; OR 2.53 [1.10, 5.80]; p=0.03*) Mean monthly consumption of	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			alcohol in units (mean 243 [sd= 488] White group; *mean 77 [sd=130] Black group; MD 165.69 [57.92, 273.47]; p=0.003*) AUDIT score (mean 15 [sd=11] White group; *mean 8 [sd=7] Black group; MD 6.97 [3.98, 9.95]; p<0.00001*) First contact with MH services more than 5 years (91/115 White group; *61/95 Black group; OR 2.11 [1.14, 3.91]; p=0.02*) No qualifications (70/110 White group; *40/83 Black group; OR 1.88 [1.05, 3.36]; p=0.03*) *Non-statistically significant differences between White and Black groups in:* Abusing cocaine/crack *(*25/*118* versus *24/95*; *OR 0.80 [0.42, 1.51]; p=0.48*) Cannabis used in 30 days prior to interview (30/87 versus *22/59*; *OR 0.89 [0.44, 1.76]; p=0.73*) Mean price of monthly cannabis use in £ (mean 44 [sd=112; N=87] versus *27 [sd=56; N=59]*; *MD 16.80 [-10.78, 44.38]; p=0.23*) Diagnosis of schizophrenia (82/118 versus *72/95*; *OR 0.73 [0.39, 1.34]; p=0.31*) Diagnosis of bipolar affective disorder (15/118 versus *7/95*; *OR 1.83 [0.71, 4.69]; p=0.21*) Unemployed (106/*117* versus *85/94*; *OR 1.02 [0.40, 2.58]; p=0.97*) Homeless (6/*117* versus *8/94*; *OR*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			0.58 [0.19, 1.74]; p=0.33) Police contact as perpetrator (24/118 versus *22/95*; *OR 0.85 [0.44, 1.63]; p=0.62*) Police contact as victim/witness (13/118 versus *12/95*; *OR 0.86 [0.37, 1.98]; p=0.72*) First contact with MH services 2-5 years (17/*115* versus *17/95*; *OR 0.80 [0.38, 1.66]; p=0.54*) Mean length of stay for all admissions over 18 months (mean 81.6 [sd=186.3; N=118] versus *91.3 [sd=129.0; N=95]*; *MD -9.74 [-52.21, 32.72]; p=0.65*) Treatment perceptions (mean 21.5 [sd=6.8; N=87] versus *21.1 [sd=6.5; N=59]*; *MD 0.44 [-1.75, 2.63]; p=0.69*) Client satisfaction (mean 22.9 [sd=5.3; N=87] versus *21.8 [sd=6.3; N=59]*; *MD 1.11 [-0.86, 3.07]; p=0.27*) Health and social care needs (mean 3.1 [sd=4.4; N=118] versus *3.7 [sd=3.9; N=95]*; *MD -0.57 [-1.69, 0.55]; p=0.32*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Barnett et al. 2007 Barnett JH, Werners U, Secher SM, Hill KE, Brazil R, Masson KIM, et al. Substance use in a population-based clinic sample of people with first-episode psychosis. British Journal of Psychiatry. 2007;190:515-20. Cohort (+)	Participants were included if they: (1) were referred to the Cameo service (a specialist early intervention service for people in Cambridge and south Cambridgeshire [and east Cambridgeshire up to Nov 2004] who experience a first episode of psychosis) between June 2002 and June 2005; (2) had positive or negative symptoms for the first time, or previous episodes that had been untreated, or were treated for less than 6 months with antipsychotic medication; (3) were aged 17-65 years pre-April-2004 or 17-35 years from April 2004. Participants were excluded if they: (1) had an intellectual disability Cambridge; Urban N: 123 Data collected: 2002-2005 Secondary mental health care; Consecutive referrals to a specialist early intervention service for people who experience a first episode of psychosis SMI method of assessment: Consensus DSM-IV diagnosis of psychosis (SCID) Substance misuse method of assessment: Substance use assessed using the St George's	Prevalence of dual diagnosis (rated by researcher): DSM-IV diagnosis of psychosis and lifetime substance abuse Characteristics of dual diagnosis: DSM-IV diagnosis of alcohol abuse or dependence (rated by researcher); DSM-IV diagnosis of cannabis abuse or dependence (rated by researcher); St George's Substance Abuse Assessment Questionnaire (self-report): Use of one or more Class A drug (lifetime); Use of one or more substances (other than alcohol)/cannabis/class A drug/amphetamines within the previous 30 days	Prevalence of dual diagnosis (*calculated by subtracting number with no substance abuse*): *66.39% (79/119)* Characteristics of dual diagnosis *(calculated as % of dual diagnosis sample*): *67.09% (*53/*79)* diagnosis of alcohol abuse or dependence *78.48% (*62/*79)* diagnosis of cannabis abuse or dependence *86.08% (*68/*79)* lifetime use of one or more Class A drug *45.57% (36/79 [calculated event rate from percentage]*) use of one or more substances (other than alcohol) within the previous 30 days *45.57% (36/79 [calculated event rate from percentage]*) use of cannabis within the previous 30 days *8.86% (7/79)* use of Class A drug within the previous 30 days *2.53% (2/79)* use of amphetamines within the previous 30 days	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Substance Abuse Assessment Questionnaire. Substance use was classified according to DSM-IV criteria; Lifetime Age (years): 17-65 (mean NR; Median: 25) Gender (% female): 24 Ethnicity (% white): NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Boys et al. 2003 [ONS national mental health survey] Boys A, Farrell M, Taylor C, Marsden J, Goodman R, Brugha T, et al. Psychiatric morbidity and substance use in young people aged 13-15 years: results from the Child and Adolescent Survey of Mental Health. British Journal of Psychiatry. 2003;182:509-17. Case-control (++)	Secondary analysis of data from participants in the 13-15 year age group who had participated in the Office for National Statistics (ONS, 1999) national mental health survey England, Scotland and Wales; Mixed N: 2624 Data collected: 1999 Comprehensive catchment area survey SMI method of assessment: Assessment based on ICD-10 and DSM-IV diagnostic criteria and supplemented by open-ended questions. Clinical raters (blind to substance use) assigned diagnosis Substance misuse method of assessment; timescale: ONS national surveys of drinking and drug use; Current (alcohol) and Lifetime (cannabis) Age (years): 13-15 (mean NR) Gender (% female): 50 Ethnicity (% white): 90	Prevalence of dual diagnosis: Risk of regular drinking (self-report; adjusted odds ratio controlling for gender, age, ethnic group, stepchildren in the family, parents' marital status, family economic status, gross weekly household income, ACORN categories and housing tenure group) amongst those with depression versus those with no psychiatric diagnosis; Risk of ever having used cannabis (self-report; adjusted odds ratio controlling for gender, age, ethnic group, stepchildren in the family, parents' marital status, family economic status, gross weekly household income, ACORN categories and housing tenure group) amongst those with depression versus those with no psychiatric diagnosis; Risk of depressive disorder (blinded clinical rater; adjusted odds ratio) amongst regular drinker versus not regular drinker or smoker and had never used cannabis/ Used cannabis versus not regular drinker or smoker and had never used cannabis/ Regular drinker and used cannabis versus not regular drinker or smoker and had never used cannabis	Increased risk of regular drinking amongst those with depression relative to those with no psychiatric diagnosis (adjusted OR=1.97, p<0.05) Increased risk of lifetime cannabis use amongst those with depression relative to those with no psychiatric diagnosis (adjusted OR=2.37, p<0.05) Increased risk of depressive disorder amongst regular drinkers and lifetime cannabis users relative to those who were not regular drinker or smoker and had never used cannabis (adjusted OR=4.61, p<0.05) No statistically significant differences in risk of depressive disorder between regular drinkers relative to those who were not regular drinker or smoker and had never used cannabis (adjusted OR=1.60, ns) or for lifetime cannabis users relative to those who were not regular drinker or smoker and had never used cannabis (adjusted OR=3.17, ns)	Identified by authors: (1) Substance use measures relied solely on self-report (2) Questions on substance use were limited and no measure of dependence was applied (3) Small numbers of individuals with particular diagnoses precluded more specific analyses examining differences in the links between substance use and individual disorders Identified by review team: (1) Population potentially not directly relevant to the review question as unclear what proportion of sample had SMI ('depressive disorder') and/or substance abuse/dependence (substance use) (2) Reliance on self-report ratings for substance use with no objective confirmation (3) Raw data not reported so restricted to extracting adjusted odds ratio

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Cantwell 2003 [Scottish Comorbidity Study] Cantwell R. Substance use and schizophrenia: effects on symptoms, social functioning and service use. British Journal of Psychiatry. 2003;182:324-29. Case-control (++)	Participants were included if they: (1) had a consensus diagnosis of schizophrenia based on ICD-10 research diagnostic criteria; (2) were aged at least 16 years; (3) were known to primary or secondary care services in one of three sites: Nithsdale (a rural area in south-west Scotland); west Glasgow (inner-city); and a suburban area of Aberdeen Scotland; Mixed N: 316 Data collected: NR Comprehensive catchment area survey (using 'key informant' method [GPs, social workers and voluntary agencies were contacted and asked to identify any patients with SMI living in the local area who were known to them] to identify participants with schizophrenia known to primary or secondary care services) SMI method of assessment: Consensus diagnosis of schizophrenia according to ICD-10 research diagnostic criteria (based on case notes) Substance misuse method of assessment; timescale: Sections 11 and 12 of the Schedules for Clinical Assessment in Neuropsychiatry (SCAN). Participants were identified	Prevalence of dual diagnosis: ICD-10 diagnosis of schizophrenia and ICD-10 harmful drug and/or alcohol use or dependence in the past year (SCAN; rated by research nurse); ICD-10 diagnosis of schizophrenia and ICD-10 harmful drug and/or alcohol use or dependence before the past year (SCAN; rated by research nurse) Characteristics of dual diagnosis: ICD-10 diagnosis of schizophrenia and ICD-10 harmful drug use or dependence in the past year (SCAN; rated by research nurse); ICD-10 diagnosis of schizophrenia and ICD-10 harmful drug use or dependence before the past year (SCAN; rated by research nurse); ICD-10 diagnosis of schizophrenia and ICD-10 harmful alcohol use or dependence in the past year (SCAN; rated by research nurse); ICD-10 diagnosis of schizophrenia and ICD-10 harmful alcohol use or dependence before the past year (SCAN) Prevalence of health and social care needs: Camberwell Assessment of Needs Short Assessment Schedule (CANSAS): Mean score (number of items and min/max score range NR; lower better; self-report) Prevalence of health care needs: Symptom severity (Positive and Negative Symptom Scale [PANSS]: Total score; Positive symptoms (including delusions, hallucinations, hyperactivity, grandiosity); Negative symptoms [number of items and min/max score range NR; lower better;	Prevalence of dual diagnosis: *20.25%* (64/136) current drug and/or alcohol; *44.62%* (141/316) lifetime drug and/or alcohol; 6.96% (22/316) current drug; 20.89% (66/316) lifetime drug 15.51% (49/316) current alcohol; 38.61% (122/316) lifetime alcohol Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *34.38% (22/64)* current drug use or dependence; *46.81% (66/141)* lifetime drug use or dependence *76.56% (49/64)* current alcohol use or dependence; *86.52% (122/141)* lifetime alcohol use or dependence Current problem substance use (ICD-10 harmful drug and/or alcohol use or dependence in the past year) versus no problem use (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant differences with higher rates in dual diagnosis group:* Social deprivation (21/64 versus 44/252; *OR 2.31 [1.25, 4.27]; p=0.008*). Symptom severity (total score mean 65.6 [sd= 16.4] versus 60.2 [sd= 17.2]; *MD 5.40 [0.82, 9.98]; p=0.02*	Identified by authors: (1) Nearly a third of the study sample did not respond (2) Hair and urine analysis were limited to 1 in 20 of the participants (3) The participants' own reports conflicted with keyworker ratings of problem substance use (but as lab analysis and participant self-report were consistent data were taken from the extended research nurse interview, i.e. participant report) Identified by review team: (1) Restricted to those known to primary or secondary care services (2) No sub-analyses possible

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	as having problem use if they met ICD-10 research criteria for harmful use or dependence; Current and lifetime Age (years): Range NR (mean: 45.3) Gender (% female): 38 Ethnicity (% white): NR	self-report]); Service utilisation (contact with psychiatrists; rated by research nurse) Prevalence of social care needs: Social deprivation (Carstairs Deprivation Index: Most deprived [determined from participants' postcodes; rated by research nurse]); Social functioning (Global Assessment Scale [GAS]; number of items and min/max score range NR; higher better; self-report); Contact with criminal justice system (Contact with police; rated by research nurse)	and positive symptoms mean 15.9 [sd= 5.9] versus 14.2 [sd= 5.9]; *MD 1.70 [0.07, 3.33]; p=0.04*). Health and social care needs (mean 6.3 [sd= 4.4] versus 4.2 [sd= 3.4]; *MD 2.10 [0.94, 3.26]; p=0.0004*). Contact with psychiatrists (61/64 versus 207/252; *OR 4.42 [1.33, 14.72]; p=0.02*). Contact with police (22/64 versus 38/252; *OR 2.95 [1.59, 5.49]; p=0.0006*). *Non-statistically significant differences in:* Social functioning (mean 49.6 [sd=11.8; N=63] versus 51.1 [sd=12.5; N=250]; *MD -1.50 [-4.80, 1.80]; p=0.37*) Negative symptoms (mean 17.1 [sd=6.2; N=63] versus 16.7 [sd=7.7; N=250]; *MD 0.40 [-1.40, 2.20]; p=0.66*) Lifetime problem substance use (ICD-10 harmful drug and/or alcohol use or dependence in the past year) versus no problem use (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant differences with higher rates in dual diagnosis group:* Social deprivation (139/239 versus	

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			26/173; *OR 7.86 [4.82, 12.83]; p<0.00001*). Positive symptom severity (mean 15.3 [sd= 6] versus 13.9 [sd= 5.8]; *MD 1.40 [0.08, 2.72]; p=0.04*). Health and social care needs (mean 5.4 [sd= 2.9] versus 4 [sd= 3.2]; *MD 1.40 [0.73, 2.07]; p<0.0001*). Contact with police (41/141 versus 19/175; *OR 3.37 [1.85, 6.13]; p<0.0001*). *Non-statistically significant differences in:* Social functioning (mean 51.1 [sd=12; N=138] versus 50.5 [sd=12.6; N=174]; *MD 0.60 [-2.14, 3.34]; p=0.67*) Symptom severity total score (mean 63.3 [sd=16.4; N=138] versus 59.7 [sd=17.6; N=174]; *MD 3.60 [-0.18, 7.38]; p=0.06*) Negative symptoms (mean 16.8 [sd=6.4; N=138] versus 16.8 [sd=7.5; N=174]; *MD 0.00 [-1.54, 1.54]; p=1.00*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Coid et al. 2006a [APMS, 2001] Coid J, Yang M, Roberts A, Ullrich S, Moran P, Bebbington P, et al. Violence and psychiatric morbidity in a national household population--a report from the British Household Survey. American Journal of Epidemiology. 2006;164:1199-1208. Case-control (+)	Secondary analysis of data from the survey of Psychiatric Morbidity among Adults [16-74 years] Living in Private Households in England, Wales, and Scotland (Singleton et al., 2001) England, Scotland and Wales; Mixed N: 5330 Data collected: 2000 Comprehensive catchment area survey SMI method of assessment: Participants screened positive for psychosis if any two of four criteria were currently present from the Psychosis Screening Questionnaire (Bebbington & Nayani, 1994) Substance misuse method of assessment; timescale: Alcohol misuse was assessed using the Alcohol Use Disorders Identification Test (AUDIT score≥8) and alcohol dependence using the Severity of Alcohol Dependence Questionnaire (SADQ). Positive responses regarding a series of different substances (cannabis, amphetamines, cocaine, crack cocaine, ecstasy, tranquilizers, opiates, and volatile substances) to any of the 5 questions measuring drug dependence over the past year	Prevalence of social care needs: Violence (Number of respondents reporting violent behaviour in the last 5 years [study-specific questions])	Psychosis and substance dependence versus no psychiatric disorder (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method)*: *Statistically significant difference with greater violent behaviour in dual diagnosis group (3/9 versus 349/4979; OR 6.63 [1.65, 26.64]; p=0.008).* Psychosis and substance dependence versus psychosis-only (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method)*: *No statistically significant difference in violent behaviour (3*/9 versus *1*/6; *OR 2.50 [0.19, 32.19]; p=0.48).* Psychosis and substance dependence versus substance dependence-only (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method)*: *No statistically significant difference in violent behaviour (3*/9 versus *124*/336*; OR 0.85 [0.21, 3.48]; p=0.83).*	Identified by authors: (1) Violent behaviour within the last 5 years was assessed via self-report and did not include objective information such as arrests or convictions (2) Diagnoses of axis I and axis II mental disorders were also derived from self-report questionnaire (3) The dating of episodes of mental disorder proved difficult and it was not identified whether violent incidents related to time periods when symptoms were present Identified by review team: (1) Reliance on self-report ratings for SMI diagnosis and substance use with no objective confirmation (2) Reliance on self-report ratings for outcome measure of violent behaviour with no objective confirmation, e.g. contact with the criminal justice system

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	were combined to produce a single category of "any" drug dependence; 6 months (alcohol), 1 year (drugs) Age (years): NR Gender (% female): NR Ethnicity (% white): NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
Commander & Odell 2001 Commander JM, Odell SM. A comparison of the needs of homeless and never homeless patients with psychotic disorders. Journal of Mental Health. 2001;10:449-56. Case-control (+)	Participants were included if they were: (1) aged 16-65 years; (2) had a clinical diagnosis of schizophrenia or other psychotic disorder Birmingham; Urban N: 78 Data collected: NR Secondary mental health care; Cases were identified through a specialist psychiatric service for people with severe mental illness who are homeless in Birmingham. Controls were randomly selected from within the same age/sex group and were drawn from a list of patients fulfilling the inclusion criteria on the caseload of an inner city CMHT SMI method of assessment: DSM-IV lifetime diagnosis of schizophrenia or other psychotic disorder Substance misuse method of assessment; timescale: A key-worker completed schedule (Drake, 1989) was used to rate substance use problems (abuse, dependence and severe dependence); 6 months Age (years): 22-56 (mean: 38) Gender (% female): 8 Ethnicity (% white): 82	Prevalence of dual diagnosis: Drake (1989) schedule: Substance use problem (abuse, dependence and severe dependence) in past 6 months (rated by keyworker) Characteristics of dual diagnosis: DSM-IV diagnosis of substance-induced psychosis (from case notes); Drake (1989) schedule: Alcohol/cannabis/stimulant/ solvent use problem (abuse, dependence and severe dependence) in past 6 months (rated by keyworker)	Prevalence of dual diagnosis (*combined across homeless and never-homeless groups*): *30.77% (24/78)* Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample and combined across homeless and never-homeless groups*): *37.50% (9/24)* substance-induced psychosis *66.67% (16/24)* alcohol use problem *45.83% (11/24)* cannabis use problem *20.83% (5/24)* stimulant use problem *8.33% (2/24)* solvent use problem Homeless versus never-homeless (*compared groups using the Mantel-Haenszel method)*: *Statistically significant difference with greater rates in the homeless group:* Substance use problem (21/39 versus 3/39; *OR 14.00 [3.68, 53.23]; p=0.0001*). Alcohol use problem (13/39 versus 3/39; *OR 6.00 [1.55, 23.21]; p=0.009*). Non-prescribed drug use problem (14/39 versus 0/39; *OR 44.92 [2.57, 786.62]; p=0.009*). Prevalence of substance-induced psychosis (9/39 versus 0/39; *OR 24.61 [1.38, 439.57]; p=0.03*).	Identified by authors: (1) Case definition was dependent on diagnoses provided by mental health staff and case note review rather than a 'gold-standard' interview-based assessment (2) Reliance on key workers for ratings of substance use may lead to an underestimation of problems Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Diagnosis of SMI taken from case notes (3) Reliance on staff ratings of substance misuse with no objective confirmation (4) Small sample size

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
Coulthard et al. 2002 [APMS, 2001] Coulthard M, Farrell M, Singleton N, Meltzer H. Tobacco, alcohol and drug use and mental health. Norwich. HMSO. 2002. Case-control (+)	Secondary analysis of data from the survey of Psychiatric Morbidity among Adults [16-74 years] Living in Private Households in England, Wales, and Scotland (Singleton et al., 2001) England, Scotland and Wales; Mixed N: 8580 Data collected: 2000 Comprehensive catchment area survey SMI method of assessment: Participants screened positive for psychosis if any two of four criteria were currently present from the Psychosis Screening Questionnaire (Bebbington & Nayani, 1994) Substance misuse method of assessment; timescale: Alcohol misuse was assessed using the AUDIT (score≥8) and alcohol dependence using the SADQ. Positive responses regarding a series of different substances (cannabis, amphetamines, cocaine, crack cocaine, ecstasy, tranquililisers, opiates, and volatile substances) to any of the 5 questions measuring drug dependence over the past year were combined to produce a single category of "any" drug dependence; 6 months (alcohol), 1 year (drugs)	Prevalence of dual diagnosis: Severity of Alcohol Dependence Questionnaire (SAD-Q): Alcohol dependence (mild, moderate or severe) in 6 months prior to interview (self-report; 20 items with total score 0-60 and lower better; dependence defined as score≥4); Study-specific questions: Drug dependent in previous year (self-report; 5 questions [used drug every day for ≥2 weeks; stated dependence; inability to cut down; need for larger amounts; withdrawal symptoms] and positive response to any 1 of 5 used to indicate drug dependence)	Prevalence of dual diagnosis (*calculated event rates based on subtracting percentage with no dependence*): *0.13% (11/8580)* with probable psychosis and alcohol dependence *0.05% (4/8580)* with probable psychosis and drug dependence Probable psychosis versus no psychosis (*calculated event rates based on subtracting percentage with no dependence and compared groups using the Mantel-Haenszel method)*: *Statistically significant difference with greater rates in the probable psychosis group:* Alcohol dependence (*11/60 versus 596/8520; OR 2.98 [1.54, 5.77]; p=0.001*) *Non-statistically significant difference in:* Drug dependence (*4*/60 versus *341*/8520; *OR 1.71 [0.62, 4.75]; p=0.30*)	Identified by authors: NR Identified by review team: (1) reliance on self-report ratings for SMI diagnosis and substance use with no objective confirmation

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Age (years): NR Gender (% female): NR Ethnicity (% white): NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Dominguez et al. 2013 Dominguez M-d-G, Fisher HL, Major B, Chisholm B, Rahaman N, Joyce J, et al. Duration of untreated psychosis in adolescents: ethnic differences and clinical profiles. Schizophrenia Research. 2013;150:526-32. Cohort (-)	Participants were included if they were: (1) new referrals to one of nine Early Intervention Services for Psychosis (EIS) in London between 2003 and 2009; (2) aged 14-35 years; (3) had presented for the first time within the last year to mental health services with more than a week of unremitting frank psychotic symptoms; (4) had less than 6 months of antipsychotic treatment for psychosis London; Urban N: 940 Data collected: 2003-2009 Secondary mental health care; Consecutive referrals to nine Early Intervention Services for Psychosis (EIS) SMI method of assessment: Diagnosis of first episode psychosis (clinical assessment mostly by care coordinators with access to clinical records) Substance misuse method of assessment; timescale: Keyworker-rated use of cannabis (rated using the Drake Substance Misuse Scale; Drake et al. 1996); Lifetime Age (years): Range NR (mean: 23) Gender (% female): 36 Ethnicity (% white): 34	Prevalence of dual diagnosis: Diagnosis of first episode psychosis (clinical assessment mostly by care coordinators with access to clinical records) and staff-rated lifetime use of cannabis (rated using the Drake Substance Misuse Scale; Drake et al., 1996) Prevalence of health care needs: Nottingham Onset Schedule (Singh et al. 2005) (NOS-DUP): Duration of Untreated Psychosis (DUP; defined as number of days between date of first positive psychotic symptoms and the date of commencement of regular prescribed antipsychotic medication with adherence for at least 75% of the time during the subsequent month); Service-DUP (defined as the number of days between date of first positive psychotic symptoms and date of referral to early intervention services)	Prevalence of dual diagnosis: 55.5% (365/658) Adolescent-onset (<age 18) of psychosis versus adult-onset (≥age 18) of psychosis (*compared groups using the Mantel-Haenszel method)*: *Non-statistically significant difference between groups in prevalence of dual diagnosis (*52/90 versus 313/568; *OR 1.11 [0.71, 1.75]; p=0.64)* Adolescent-onset (<age 18) of psychosis versus adult-onset (≥age 18) of psychosis (compared groups using the Mann-Whitney Test): Statistically significant differences between groups, with greater rates in adolescent group for: DUP (median 179 [IQR=18-514.5; N=118] versus 81 [IQR=19-244; N=727]; U = 36,058.5, p=0.005) Service-DUP (median 346 [IQR=105.5-721.3; N=136] versus 120 [IQR=37.0-311.3; N=804]; U = 37,238.5, p<0.001)	Identified by authors: 1) Age of onset was only available for 69.8% (n=940) of the original sample and this could have potentially influenced the results (2) Age of onset revealed 15 individuals whose first positive psychotic symptoms were identified below age 14. This distribution raises the question about whether experiences in this age group were true psychotic experiences (3) Data on age of onset and duration of untreated psychosis were unavoidably retrospective (4) Clinical information on individuals' presentation was only available at EIS entry, so that clinical variables with a high potential for influencing duration of untreated psychosis could not be explored further Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on staff ratings of substance misuse with no objective confirmation (3) Large amount of missing data for the substance misuse measure (30%; n=282)

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Donoghue et al. 2011 [AESOP & SIN study] Donoghue K, Medley I, Brewin J, Glazebrook C, Mason P, Cantwell R, et al. The association between substance misuse and first-episode psychosis in a defined UK geographical area during the 1990s. Social Psychiatry and Psychiatric Epidemiology. 2011;46:137-42. Cohort (-)	Secondary analysis of data from two epidemiological studies: the Schizophrenia in Nottingham (SIN) study conducted 1992-1994 and the Aetiology and Ethnicity of Schizophrenia and Other Psychoses (AESOP) conducted 1997-1999. The common inclusion criteria were: (1) aged 16-64 years; (2) resident in the defined catchment area, Nottingham; (3) no previous contact with services with psychotic symptoms; (4) presence of delusions, hallucinations, thought disorder, bizarre or psychotic behaviour that may indicate a psychotic illness; (5) absence of an organic cause resulting from cerebral atrophy/injury or severe learning disability Nottingham; Urban N: 371 Data collected: 1992-1994 & 1997-1999 Secondary mental health care; Potential cases presenting to psychiatric services over a 2-year period with a first-episode of psychosis SMI method of assessment: Consensus diagnosis of a psychotic disorder according to ICD-10 criteria (based on Schedules for Clinical Assessment in Neuropsychiatry	Prevalence of dual diagnosis: ICD-10 diagnosis of a psychotic disorder and a comorbid ICD-10 diagnosis of harmful substance use or dependence (consensus diagnosis made by a group of clinicians blind to patient identity) Characteristics of dual diagnosis: ICD-10 diagnosis of harmful cannabis use or dependence (consensus diagnosis made by a group of clinicians blind to patient identity)	Prevalence of dual diagnosis (*combined SIN and AESOP data*): 16-64 year age group: *15.09% (56/371)* 16-29 year age group: *23.19% (48/207)* Characteristics of dual diagnosis (*combined SIN and AESOP data; calculated as % of dual diagnosis sample*): Harmful cannabis use or dependence: 16-64 year age group: *37.50% (21/56)*; 16-29 year age group: *31.25% (15/48)*	Identified by authors: (1) Lack of corroboration of self-report of drug use with the use of biological techniques such as hair or urine analysis (2) Sample size of participants with a substance use disorder is relatively small and the lack of statistical power may therefore have increased the chance of a type two error Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on self-report ratings for substance use with no objective confirmation

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	[SCAN] or the SCAN Item Group Checklist [IGC] completed from case notes for participants declining interview) Substance misuse method of assessment; timescale: Self-report of drug use and consensus diagnostic meeting where ICD-10 diagnoses of comorbid substance harmful use or dependence were assigned; Current Age (years): 16-64 (mean NR) Gender (% female): 41 Ethnicity (% white): 76			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Donoghue et al. 2014 [AESOP study] Donoghue K, Doody GA, Murray RM, Jones PB, Morgan C, Dazzan P, et al. Cannabis use, gender and age of onset of schizophrenia: Data from the AESOP study. Psychiatry Research. 2014;215:528-32. Case-control (++)	Participants were included if they: (1) presented to mental health services with a first-episode of psychosis between 1997 and 1999 (all points of secondary mental health contact were monitored to identify all potential cases of first-episode psychosis); (2) aged 16-45 years; (3) received a consensus ICD-10 diagnosis of schizophrenia or schizoaffective disorder (F20, F25) London (south east) and Nottingham; Urban N: 143 Data collected: 1997-1999 Secondary mental health care; Presentations of first-episode psychosis to mental health services (all points of secondary mental health contact were monitored to identify all potential cases of first-episode psychosis) SMI method of assessment: Consensus diagnosis of schizophrenia or schizoaffective disorder according to ICD-10 criteria (based on SCAN or the IGC for participants declining interview) Substance misuse method of assessment; timescale: Any use at all of cannabis before the first contact with mental health services	Prevalence of dual diagnosis: ICD-10 consensus diagnosis of schizophrenia or schizoaffective disorder and any use at all of cannabis before the first contact with mental health services (rated by clinician using the Personal and Psychiatric History Schedule [PPHS], which included information provided by a relative or carer, the SCAN and clinical case notes) Age variation: Age at first psychotic symptom (years) collated from interviews with patient, a close relative, and clinical notes using the Personal and Psychiatric History Schedule (PPHS); Age at first mental health contact (years; self-report, relative-report and case notes) Gender variation: Number of females Ethnic variation: Number of white participants Prevalence of social care needs: Education: Number of participants with no qualifications (outcome measure NR); Employment: Number of unemployed participants (outcome measure NR) Prevalence of health care needs: Met and unmet treatment needs: Duration of Untreated Psychosis (DUP; defined as number of days from the onset of psychosis to first contact with mental health services for psychosis, collated from interviews with patient, a close relative, and clinical notes using the PPHS) Symptom severity: Mode of onset of	Prevalence of dual diagnosis: 59.44% (85/143) Schizophrenia/schizoaffective disorder and lifetime cannabis use versus schizophrenia/schizoaffective disorder and no lifetime cannabis use (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant differences, with lower rates in the dual diagnosis group:* Age at first mental health contact (mean 26.4 [sd=6.7] versus 30.1 [sd=8.5]; *MD -3.70 [-6.31, -1.09]; p=0.005*) Age at first psychotic symptom (mean 25.7 [sd=6.3] versus 29.2 [sd=7.9]; *MD -3.50 [-5.93, -1.07]; p=0.005*) Number of females (23/85 versus 33/58; *OR 0.28 [0.14, 0.57]; p=0.0004*) *Statistically significant differences, with higher rates in the dual diagnosis group:* Number of white participants (42/85 versus 17/58; *OR 2.36 [1.16, 4.78]; p=0.02*) *Non-statistically significant differences in:* Number of participants with no	Identified by authors: (1) The data on substance misuse was collected retrospectively and relied on self-report (2) No information available as to when use of illegal substances began, frequency and quantity of use Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Data not reported on current misuse of cannabis or lifetime or current misuse of other substances

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	assessed using the Personal and Psychiatric History Schedule (PPHS), which included information provided by a relative or carer, the SCAN and clinical case notes; Lifetime Age (years): Range NR but inclusion criteria 16-45 years (mean: 27.9) Gender (% female): 39 Ethnicity (% white): 41	psychosis: Acute/Insidious (outcome measure NR)	qualifications (23/85 versus 16/58; *OR 0.97 [0.46, 2.06]; p=0.94*) Number of unemployed participants (54/85 versus 32/58; *OR 1.42 [0.72, 2.79]; p=0.32*) Acute mode of onset of psychosis (34/85 versus 21/58; *OR 1.17 [0.59, 2.34]; p=0.65*) Insidious mode of onset of psychosis (47/85 versus 34/58; *OR 0.87 [0.44, 1.72]; p=0.69*) Schizophrenia/schizoaffective disorder and lifetime cannabis use versus schizophrenia/schizoaffective disorder and no lifetime cannabis use (compared groups using the Mann-Whitney U test): Non-statistically significant difference between groups in: DUP (median 86 [IQR=31-238; N=85] versus 138 [IQR=29-546; N=58]; U and p NR)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Duke et al. 2001 Duke PJ, Pantelis C, McPhillips MA, Barnes TR. Comorbid non-alcoholic substance misuse among people with schizophrenia: epidemiological study in central London. British Journal of Psychiatry. 2001;179:509-13. Cohort (-)	Comprehensive census survey of patients with severe chronic mental illness living in permanent or temporary accommodation in the postal district of SW1. Participants were included if they: (1) had no fixed abode, were currently in hospital or were in contact with area-based community services, including primary care London (Westminster); Urban N: 337 Data collected: 1990 Comprehensive catchment area survey SMI method of assessment: ICD-9 diagnosis of schizophrenia, schizoaffective disorder or paranoid psychosis (based on a detailed questionnaire and case note review) Substance misuse method of assessment; timescale: Substance misuse was assessed using the Substance Use Rating Scale, patient version (SURSp; Duke et al. 1994); Current and lifetime Age (years): Range NR (mean: 50.3) Gender (% female): 46 Ethnicity (% white): 77	Prevalence of dual diagnosis: ICD-9 diagnosis of schizophrenia, schizoaffective disorder or paranoid psychosis (self-report and case note review) and lifetime history of misuse of substances other than alcohol (SURSp; self-report); ICD-9 diagnosis of schizophrenia, schizoaffective disorder or paranoid psychosis (self-report and case note review) and current (previous month) misuse of substances other than alcohol (SURSp; self-report) Characteristics of dual diagnosis: SURSp (self-report): Number reporting lifetime cannabis/stimulant/ecstasy/LSD/ PCP/opiate/sedative/anticholinergic use	Prevalence of dual diagnosis: 4.91% (13/265) current drug misuse; 21.51% (57/265) lifetime drug misuse Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *89.47% (51/57)* lifetime cannabis use *40.35% (23/57)* lifetime stimulant use *3.51% (2/57)* lifetime ecstasy use *36.84% (21/57)* lifetime LSD use *1.75% (1/57)* lifetime PCP use *24.56% (14/57)* lifetime opiate use *12.28% (7/57)* lifetime sedative use *33.33% (19/57)* lifetime anticholinergic use	Identified by authors: (1) Results relate to a catchment area population in inner London and may not be generalisable to suburban or rural areas (2) Likely that the self-report questionnaire method used yielded an underestimate of recent non-alcohol substance misuse (3) Census method yields a cross-sectional picture of substance misuse in a particular place at a particular time. Longitudinal studies are required to assess whether non-alcohol substance misuse persists over time and the long-term impact of such use Identified by review team: (1) Reliance on self-report ratings for substance use with no objective confirmation

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Frisher & Akram 2001/ Frisher et al. 2004/2005a [GPRD] Frischer M, G Akram. Prevalence of comorbid mental illness and drug use recorded in general practice: preliminary findings from the General Practice Research Database. Drugs: Education, Prevention and Policy. 2001;8:275-80. Frisher M, Collins J, Millson D, Crome I, Croft P. Prevalence of comorbid psychiatric illness and substance misuse in primary care in England and Wales. Journal of Epidemiology & Community Health. 2004;58:1036-41. Frisher M, Crome I, Macleod J, Millson D, Croft P. Substance misuse and psychiatric illness: prospective observational study using the general practice research database. Journal of Epidemiology & Community Health. 2005;59:847-50. Cohort (+)	Secondary analysis of the General Practice Research Database (GPRD). Participating GPs (N=230 practices) enter all prescriptions as well as significant morbidity and consultation outcomes. The national database contains information on around 5 million patients while the West Midlands subset utilized in this study contained 527,000 patient records. England and Wales; NR N: 527,185 Data collected: 1993-1998 Primary care SMI method of assessment: ICD-9 diagnosis of schizophrenia or psychoses from GPRD Substance misuse method of assessment; timescale: ICD-9 diagnosis of non-dependent abuse of illicit drugs or dependence on or addiction to illicit drugs and a third category which is not covered by ICD-9, namely abuse of (prescription) licensed psychoactive medicines (e.g. benzodiazepines) from GPRD; 4 years Age (years): NR Gender (% female): NR Ethnicity (% white): NR	Prevalence of dual diagnosis: ICD-9 diagnosis of schizophrenia or psychoses and abuse or dependence of illicit or prescription drugs (from GPRD database) Population attributable risk proportion of illness in the population attributable potentially explained by the exposure: Substance misuse (exposure) and schizophrenia and psychoses (illness); Schizophrenia and psychoses (exposure) and substance misuse (illness)	Prevalence of dual diagnosis (*combined psychoses and schizophrenia groups*): *0.02% (126/527185)* Proportion of schizophrenia and psychoses in the general population that is potentially explained by exposure to substance misuse = 0.11 [0.01, 0.21] Proportion of substance misuse in the general population that is potentially explained by exposure to schizophrenia and psychoses = 0.76 [0.47, 1.05]	Identified by authors: (1) Prevalence estimates depend on recorded diagnosis by general practitioners, and are likely to be minimum estimates of comorbidity in the community as a whole as it is known that much substance misuse in the community is not brought to the attention of GPs and much mental illness goes undetected by the healthcare services (2) The time interval between drug abuse and mental illness diagnoses may suggest that the episodes of morbidity are distinct rather than related in any meaningful way Identified by review team: (1) Restricted to those in contact with primary care services (2) Limited demographic information (3) No sub-analyses possible (4) Definition of comorbidity (i.e. a patient was defined as comorbid if their records contained a diagnosis from each of psychiatric diagnosis and substance abuse categories but the diagnoses for either condition could occur at any time between January 1993 and December 1997 so they were not required to be simultaneous)

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Frisher et al. 2013 [GPRD] Frisher M, Martino OI, Bashford J, Crome I, Croft P. Incidence of psychoses among drug dependent patients in primary care with no psychiatric history: a retrospective observational matched-cohort study. The European Journal of Psychiatry. 2013;27:240-47 Case-control (++)	This study cohort includes all patients aged 16-44 in 183 General Practice Research Database (GPRD) practices. Cases had GP-recorded drug misuse/dependence, at least 5 years free of GP-recorded psychiatric illness and drug misuse/dependence prior to the incident drug misuse/dependence diagnosis. These were matched to controls by age, gender and practice. Controls were registered for at least 5 years with no record of drug misuse/dependence at any point, and no recorded psychiatric illness prior to the date of the incident substance misuse event in their matched case England, Scotland, Wales and Northern Ireland; Mixed N: 1184 Data collected: 1996-2005 Primary care SMI method of assessment: Diagnosis of psychosis (from case notes) Substance misuse method of assessment; timescale: Drug misuse/dependence events were taken from diagnostic and treatment (i.e. prescription) events; timescale NR	Incidence of dual diagnosis: Diagnosis of psychosis (from case notes)	Patients with a diagnosis of drug misuse/dependence on the GPRD versus patients on the GPRD with no recorded history of drug misuse/dependence (*compared groups using the Mantel-Haenszel method):* *Non-statistically significant difference in:* Diagnosis of psychosis (6/592 versus 0/592; *OR 13.13 [0.74, 233.65]; p=0.08*)	Identified by authors: (1) Only those with a drug use problem severe enough to be consulting their GP (e.g. addiction, or receiving methadone) will be recorded. Similarly, controls are defined only as those without a diagnosis of drug misuse; this does not necessarily mean that they have never used drugs. Thus the findings only provide a measure of the risk for psychiatric illness with drug misuse/dependence on a level problematic enough to consult the GP; they cannot be used to draw conclusions concerning the risk among the general population, or with more "casual" drug use (2) Most of the drug misuse/dependence diagnoses on the GPRD are not for specific drugs, but for "drug abuse" or "drug addiction", therefore it is not possible to stratify analysis by the type of drug involved (e.g. cannabis or amphetamines) (3) Database contains no information about the precise nature and extent of problematic drug use (4) By the end of 2005, 15.2% of cases and 4.3% of controls left the database without a psychiatric diagnosis. 37% of censored cases occurred within the first 2 years, compared to 15% of censored controls. This indicates that early departure was more frequent and more rapid among the cases. This could introduce bias if these cases are more likely to have psychoses Identified by review team: (1) Restricted to those in contact with

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Age (years): Range NR (mean: 29) Gender (% female): NR Ethnicity (% white): NR			primary care services (2) No sub-analyses possible (3) Potential attrition bias with higher drop-out in the cases (15%) than in the controls (4%)

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Gaite et al. 2002 [EPSILON study] Gaite L, Vázquez-Barquero JL, Borra C, Ballesteros J, Schene A, et al. Quality of life in patients with schizophrenia in five European countries: the EPSILON study. Acta Psychiatrica Scandinavica. 2002;105:283-92. Cohort (-)	Participants were included if they were: (1) aged 18-65 years; (2) had an ICD-10 diagnosis of any psychotic disorder (F20-F25); (3) had been in contact with mental health services during the 3-month period preceding the start of the study. Participants were excluded if they: (1) were currently residing in prison, secure residential services or hostels for long-term patients; (2) had coexisting learning disability, primary dementia or other severe organic disorder; (3) had extended inpatient treatment episodes longer than one year London; Urban N: 84 (This study reports data from five European sites [Amsterdam, Copenhagen, London, Santander and Verona]) but data only extracted for London Year/s of data collection NR Secondary mental health care; Caseloads of local specialist mental health services (inpatient, outpatient and community) SMI method of assessment: ICD-10 diagnosis of psychotic disorder (F20-F25) based on item group checklist (SCAN) Substance misuse method of assessment; timescale: Outcome	Prevalence of dual diagnosis: Alcohol abuse (outcome measure and rater NR; lifetime ['previous history']); Drug abuse (outcome measure and rater NR; lifetime ['previous history'])	Prevalence of dual diagnosis (*calculated event rates from percentages*): 75% (*63*/84) previous history of alcohol abuse 70% (*59*/84) previous history of drug abuse	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Inpatients and outpatients and not clear what proportion of participants were living in the community (3) Small sample size (4) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	measure and rater NR; lifetime ('previous history') Age (years): Range NR but inclusion criteria 18-65 years (mean: 43.8) Gender (% female): 42 Ethnicity (% white): 66			
Graham et al. 2001/ Graham & Maslin 2002 Graham HL, Maslin J, Copello A, Birchwood M, Mueser K, McGovern D, et al. Drug and alcohol problems amongst individuals with severe mental health problems in an inner city area of the UK. Social Psychiatry & Psychiatric Epidemiology 2001;36:448-55. Graham HL, J Maslin. Problematic cannabis use amongst those with severe mental health problems in an inner city area of the UK. Addictive Behaviors. 2002:27:261-73. Cohort (+)	The main inclusion criterion for the study was that the client had a designated keyworker within adult community-based Substance Misuse and Mental Health services Birmingham; Urban N: 3682 Data collected: 1998 Mixed service settings; Caseloads of community-based substance misuse and mental health services SMI method of assessment: Diagnosis of SMI (from case notes and official Care Programme Approach documentation) or if no diagnosis had been made, their primary presenting mental health problem, classified according to ICD–10 criteria Substance misuse method of assessment; timescale: Keyworker-rated substance abuse/dependence (based on AUS and DUS); 1 year Age (years): 18-69 (mean NR; Median: 34-37)	Prevalence of dual diagnosis: Diagnosis of SMI (from case notes) and keyworker-rated substance abuse/dependence (clinician-rated scales for drug and alcohol use; Drake et al., 1989) Characteristics of dual diagnosis: ICD-10 diagnosis (from case notes) of schizophrenia, schizotypal and delusional disorders/major mood (affective) disorder; Alcohol/cannabis/cocaine/amphetamine/ opiates/substitute prescribing/ benzodiazepine/ecstasy/polydrug abuse/dependence (from self-report, behavioural observations, information from carers/relatives, blood/urine tests, and/or case notes) Prevalence of health care needs: Service utilisation: Number of hospital admissions/episodes of Home Treatment over past year = 1/Number of hospital admissions/episodes of Home Treatment over past year = 2–5 Mental Health/2–4 Substance Misuse services (rated by keyworker); Service location: within Mental Health services/Substance Misuse services/Assertive Outreach Mental Health Teams; Suicide: Incidence of suicidal ideation/behaviour or self-harm over past year (rated by keyworker)	Prevalence of dual diagnosis (*combined data for the use with impairment and use with dependence groups and did not extract data for the use without impairment group*): *8.80% (324/3682)* of community-based Substance Misuse and Mental Health caseloads with dual diagnosis *23.67% (324/1369)* of SMI clients with substance misuse Characteristics of dual diagnosis (*combined use with impairment and use with dependence and did not extract data for use without impairment and calculated as a % of dual diagnosis sample*): *69.44% (225/324)* schizophrenia, schizotypal and delusional disorders *30.56% (99/324)* major mood (affective) disorder *60.80% (197/324)* alcohol abuse/dependence *42.90% (139/324)* cannabis abuse/dependence *10.19% (33/324)* cocaine abuse/dependence *10.49% (34/324)* amphetamines abuse/dependence	Identified by authors: (1) Only reports on clients who have a designated keyworker within community-based teams/services, and does not include those clients seen solely in psychiatric out-patient clinics or those in contact with Home Treatment teams (2) Assessment of substance use was based on keyworker rating scales, and this will to some extent be subjective (3) No information was gathered from keyworkers on those people with a severe mental illness diagnosis who were not using drugs or alcohol Identified by review team: (1) Restricted to those in contact with secondary mental health or substance misuse services (2) Reliance on self-report ratings for substance use with no objective confirmation (3) Does not report data for SMI clients without substance misuse so no comparison possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
	Gender (% female): 21 Ethnicity (% white): 48		*8.64% (28/324)* opiates abuse/dependence *5.86% (19/324)* substitute prescribing abuse/dependence *6.79% (22/324)* benzodiazepine abuse/dependence *2.16% (7/324)* ecstasy abuse/dependence *30.25% (98/324)* polydrug abuse/dependence Prevalence of health care needs (*combined use with impairment and use with dependence and did not extract data for use without impairment and calculated as a % of dual diagnosis sample*): Service utilisation: *27.78% (90/324)* had 1 hospital admission/episode of Home Treatment over past year; *19.75% (64/324)* had 2–5 for Mental Health services/2–4 for Substance Misuse services hospital admissions/episodes of Home Treatment over past year; *83.33% (270/324)* located within Mental Health services; *16.67% (54/324)* located within Substance Misuse services; *39.20% (127/324)* located within Assertive Outreach Mental Health Teams Suicide: *27.78% (90/324)* incidence of suicidal ideation/behaviour or self-harm over past year	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Hipwell et al. 2000 Hipwell AE, Singh K, Clark A. Substance misuse among clients with severe and enduring mental illness: service utilisation and implications for clinical management. Journal of Mental Health. 2000;9:37-50. Case-control (-)	All of the 16 case group clients had been given a diagnosis of schizophrenia or schizoaffective illness, were current regular substance users and had been allocated at least 1 day per week at the Day-Service. The control group was selected from the remaining clients who had been given a diagnosis of schizophrenia or schizoaffective illness, and who had also been allocated at least 1 day per week in the service but were not regular substance users. All the clients in the study had met the Care Programme Approach (Department of Health, 1990) criteria of having complex needs requiring multi-agency input (Tier 3) Region NR (3 geographical localities each containing a small market town and outlying village communities); Semi-rural N: 32 Year/s of data collection NR Secondary mental health care; Attenders of a day hospital service (part of a Community Mental Health Centre) which provides comprehensive care and intensive crisis support for individuals with severe and enduring mental illness SMI method of assessment: Diagnosis of schizophrenia or	Prevalence of dual diagnosis: Diagnosis of SMI and identified by keyworker as regular substance user Characteristics of dual diagnosis: Interview derived from Addiction Severity Index (McLellan et al. 1980; self-report): Alcohol consumption per week (units); Drinking>21 units/week (current); Regular drinking of more than the recommended limit of alcohol per week at any time in the past; Regular use of substances other than alcohol (current/lifetime); Regular use of cannabis (current/lifetime); Regular use of heroin (current); Regular use of amphetamines (current/lifetime); Regular use of analgesics (current); Regular use of cocaine (current); Regular use of ecstasy (current) Prevalence of health care needs: Service utilisation (age at first mental health contact [years; self-report]; number of participants admitted to an inpatient facility in the past year because of psychotic relapse [self-report]; number of participants placed on Intensive Crisis Support ([CS] by the Day Service staff in the past year [self-report]) Prevalence of social care needs: Housing (time at present address [years; self-report]; number of participants who had been homeless in the past [self-report]); Education (number of participants who had left school by 16 years [self-report]; Employment (number of participants in sheltered employment [self-report]); Contact with the criminal justice system	Prevalence of dual diagnosis: 23.53% (16/68) Characteristics of dual diagnosis (*calculated as a % of dual diagnosis sample*): Mean alcohol consumption per week (units): 31 (sd=43.5) *31.25% (5/16)* drinking>21 units/week (current) *75% (12/16)* regular drinking of more than the recommended limit of alcohol per week at any time in the past *78.57% (11/14)* regular use of substances other than alcohol *90.91% (10/11)* regular use of cannabis (current); *50% (7/14)* regular use of cannabis in the past *27.27% (3/11)* regular use of heroin *27.27% (3/11)* regular use of amphetamines (current); *50% (7/14)* regular use of amphetamines in the past *9.09% (1/11)* regular use of analgesics *9.09% (1/11)* regular use of cocaine *9.09% (1/11) r*egular use of ecstasy Day hospital attenders with schizophrenia who were current regular substance users versus day hospital attenders with schizophrenia who were not regular substance users (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*:	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health service (2) Diagnosis of SMI taken from case notes (3) Reliance on staff ratings of substance misuse with no objective confirmation (4) Reliance on self-report for the majority of outcome measures (5) Small sample size (6) Data was not reported for all outcome measures, including for social functioning and support network (measured using The Quality of Life Scale; Heinrichs et al. 1984) or psychiatric symptoms (measured using the Brief Psychiatric Rating Scale [BPRS; Overall & Gomran, 1962])

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
	schizoaffective illness (no further detail reported) Substance misuse method of assessment; timescale: Keyworkers identified current attenders who were regularly using substances (i.e. three or more times per week); Current Age (years): 19-53 (mean: 33.4) Gender (% female): 38 Ethnicity (% white): NR	(number of participants who had been arrested [self-report; timescale NR]; number of participants who had been victim of a crime [self-report; timescale NR])	*Statistically significant differences, with lower rates in the dual diagnosis group:* Time at present address in years (mean 3.1 [sd=3] versus 11.4 [sd=13.3]; *MD -8.30 [-14.98, -1.62]; p=0.01*) *Statistically significant differences, with higher rates in the dual diagnosis group:* Alcohol consumption per week in units (mean 31 [sd=43.5] versus 3.1 [sd=4.09]; *MD 27.90 [5.03, 50.77]; p=0.02*) Regular use of substances other than alcohol in the past (13/14 versus 3/14; *OR 47.67 [4.32, 526.17]; p=0.002*) Been homeless in the past (8/16 versus 1/16; *OR 15.00 [1.58, 142.17]; p=0.02*) Arrested (12/16 versus 5/16; *OR 6.60 [1.40, 31.05]; p=0.02*) Victim of a crime (9/16 versus 2/16; *OR 9.00 [1.52, 53.40]; p=0.02*) Admission to an inpatient facility in the past year because of psychotic relapse (10/16 versus 4/16; *OR 5.00 [1.10, 22.82]; p=0.04*) Placed on Intensive Crisis Support (ICS) by the Day-Service staff in the past year (8/16 versus 0/16; *OR 33.00 [1.69, 643.09]; p=0.02*) *Non-statistically significant differences between groups in:* Drinking>21 units/week (5/16	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			versus 0/16; *OR 15.78 [0.79, 314.27]; p0.07*) Age at first mental health contact (mean 22.2 [sd=6.7; N=16] versus 25.4 [sd=8.6; N=16]; *MD -3.20 [-8.54, 2.14]; p=0.24*) Left school by 16 years (13/16 versus 7/14; *OR 4.33 [0.84, 22.23]; p=0.08*) Sheltered employment (1/16 versus 5/15; *OR 0.13 [0.01, 1.32]; p=0.08*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
Houston et al. 2011 [APMS, 2007] Houston JE, Murphy J, Shevlin M, Adamson G. Cannabis use and psychosis: re-visiting the role of childhood trauma. Psychological Medicine. 2011;41:2339-48. Case-control (++)	Data were based on the Adult Psychiatric Morbidity Survey (APMS) conducted in England in 2007. The APMS was designed to be representative of the population living in private households in England England; Mixed N: 7394 Data collected: 2007 Comprehensive catchment area survey SMI method of assessment: ICD-10 diagnosis of schizophrenia or affective psychosis (based on SCAN) Substance misuse method of assessment; timescale: Hazardous alcohol use (AUDIT score >8); Current Age (years): Range NR (mean: 51.1) Gender (% female): 51 Ethnicity (% white): 90	Prevalence of dual diagnosis: ICD-10 diagnosis of schizophrenia or affective psychosis (SCAN rated by trained clinical interviewers) and hazardous alcohol use (AUDIT>8; self-report); : ICD-10 diagnosis of schizophrenia or affective psychosis (SCAN rated by trained clinical interviewers) and lifetime cannabis use (Study-specific questionnaire: Have you ever taken cannabis even if it was a long time ago?=Yes)	Prevalence of dual diagnosis: *0.07%* (5/7394) current alcohol; *0.16%* (12/7394) lifetime cannabis Psychosis versus no psychosis (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rate in dual diagnosis group:* Lifetime cannabis use (12/29 versus 1687/7365; *OR 2.38 [1.13, 4.98]; p=0.02*) *Non-statistically significant difference between groups in*: Current hazardous alcohol use (5/29 versus 1614/7365; *OR 0.74 [0.28, 1.95]; p=0.55*)	Identified by authors: NR Identified by review team: (1) Reliance on self-report ratings for substance use with no objective confirmation (2) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Leeson et al. 2012 Leeson VC, Harrison I, Ron MA, Barnes TR, Joyce EM. The effect of cannabis use and cognitive reserve on age at onset and psychosis outcomes in first-episode schizophrenia. Schizophrenia Bulletin. 2011;38:873-80. Case-control (+)	Inpatients and outpatients with a first-psychotic episode were recruited London (west); Urban N: 99 Year/s of data collection NR Secondary mental health care SMI method of assessment: DSM-IV diagnosis of psychosis (based on the Diagnostic Interview for Psychosis-Diagnostic Module [DIP-DM]) Substance misuse method of assessment; timescale: Cannabis use (assessed using the semistructured interview within the DIP-DM); Lifetime Age (years): Range NR (mean: 25.1) Gender (% female): 35 Ethnicity (% white): NR	Prevalence of dual diagnosis: Diagnostic Interview for Psychosis-Diagnostic Module (DIP-DM): Cannabis use during lifetime (rater NR) Characteristics of dual diagnosis: DIP-DM: Schizophrenia/Schizophreniform disorder/Schizoaffective disorder (rater NR) Gender variation: Number of females Age variation: Age at testing (years; self-report); Nottingham Onset Scale (Singh et al., 2005): Age at prodrome/psychosis onset (years; rater NR) Prevalence of health care needs: Symptom severity (DIP-DM: Mode of illness onset [scale of 1-5 ranging from abrupt onset within hours or days to insidious onset over a period greater than 6 months; self-report]; Schedule for the Assessment of Insight at baseline and change at 15-month follow-up [David et al., 1992; self-report; number of items and min/max score range NR; higher better]; Scales for the Assessment of Positive and Negative Symptoms [Andreasen, 1990] – Negative/positive/ disorganisation syndrome at baseline and change at 15-month follow-up [rater NR; number of items and min/max score range NR; lower better]; Hamilton Rating Scale for Depression at baseline and change at 15-month follow-up [rater NR; number of items and min/max score range NR; lower better]; Young Mania Rating Scale at baseline and change at 15-month follow-	Prevalence of dual diagnosis: *65.66%* (65/99) Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *92.31% (60/65)* schizophrenia *7.69% (5/65)* schizoaffective disorder Schizophrenia/schizoaffective disorder and lifetime cannabis use versus schizophrenia/schizoaffective disorder and never used cannabis (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with lower rates in dual diagnosis group*: Age at testing (mean 23.42 [sd=6.06] versus 28.29 [sd=10.87]; *MD -4.87 [-8.81, -0.93]; p=0.02*) Age at prodrome onset (mean 21.22 [sd=6.04] versus 26.35 [sd=10.62]; *MD -5.13 [-8.99, -1.27]; p=0.009*) Age at psychosis onset (mean 21.97 [sd=5.8] versus 27.12 [sd=10.68]; *MD -5.15 [-9.01, -1.29]; p=0.009*) Adherence to medication (medication type NR) at baseline (mean 4.78 [sd=1.66] versus 5.53 [sd=1.38]; *MD -0.75 [-1.36, -*	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Inpatients and outpatients and not clear what proportion of participants were living in the community (3) No data reported on current cannabis use or on abuse/dependence on cannabis or other substances (4) Small sample size

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
		up [Young et al., 1978; rater NR; number of items and min/max score range NR; lower better]); Symptom duration (Premorbid Social Adjustment Scale: Schizoid and schizotypal traits between ages 5-11/ 12-16 [self- and carer-report]; Nottingham Onset Scale [Singh et al., 2005]: Duration of untreated psychosis [weeks between psychosis onset and treatment initiation; rater NR; lower better]/ Duration of untreated prodrome [weeks between the onset of prodrome and psychosis; rater NR]); Medication adherence at baseline and change at 15-month follow-up (Compliance Rating Scale [Hayward et al., 1995]; rater NR; number of items and min/max score range NR; higher better); Service utilisation (Number of days spent in hospital during index admission [rater NR]; Number of days spent in hospital during the first 2 years of illness [rater NR]) Prevalence of social care needs: Education (years of education; rater NR); Social functioning at baseline and change at 15-month follow-up (Social Function Scale [Birchwood et al., 1990]; self-report; higher better)	*0.14]; p=0.02*) *Statistically significant difference between groups, with higher rates in dual diagnosis group*: Social function at baseline (mean 113.1 [sd=9.13] versus 108.24 [sd=9.81]; *MD 4.86 [0.89, 8.83]; p=0.02*) *Non-statistically significant differences between groups in:* Number of females (*author reports number of males and review team converted to number of female*s; *19*/65 versus *16*/34; *OR 0.46 [0.20, 1.10]; p=0.08*) Schizophrenia (60/65 versus 27/34; *OR 3.11 [0.91, 10.69]; p=0.07*) Schizophreniform disorder (0/65 versus 1/34; *OR 0.17 [0.01, 4.30]; p=0.28*) Schizoaffective disorder (5/65 versus 6/34; *OR 0.39 [0.11, 1.38]; p=0.14*) Years of education (mean 12.46 [sd=1.91; N=65] versus 12.79 [sd=2.01; N=34]; *MD -0.33 [-1.15, 0.49]; p=0.43*) Mode of illness onset (mean 3.31 [sd=1.18; N=65] versus 3.42 [sd=1.3; N=34]; *MD -0.11 [-0.63, 0.41]; p=0.68*) Schizoid and schizotypal traits between ages 5-11 (mean 2.28 [sd=0.98; N=65] versus 2.22 [sd=1.02; N=34]; *MD 0.06 [-0.36, 0.48]; p=0.78*) Schizoid and schizotypal traits	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			between ages 12-16 (mean 2.26 [sd=0.89; N=65] versus 2.49 [sd=1.04; N=34]; *MD -0.23 [-0.64, 0.18]; p=0.27*) Insight at baseline (mean 7.7 [sd=4.61; N=65] versus 9 [sd=4.38; N=34]; *MD -1.30 [-3.15, 0.55]; p=0.17)* or change at 15-month follow-up (mean 2.73 [sd=6.06; N=50] versus 1.06 [sd=4.93; N=21]; *MD 1.67 [-1.03, 4.37]; p=0.22*) Negative symptom severity at baseline (mean 0.3 [sd=0.26; N=65] versus 0.4 [sd=0.28; N=34; *MD -0.10 [-0.21, 0.01]; p=0.08)* or change at 15-month follow-up (mean 0.15 [sd=0.23; N=50] versus 0.06 [sd=0.27; N=21]; *MD 0.09 [-0.04, 0.22]; p=0.18*) Positive symptom severity at baseline (mean 0.72 [sd=0.22; N=65] versus 0.72 [sd=0.22; N=34]; *MD 0.00 [-0.09, 0.09]; p=1.00)* or change at 15-month follow-up (mean 0.46 [sd=0.44; N=50] versus 0.33 [sd=0.29; N=21]; *MD 0.13 [-0.04, 0.30]; p=0.14*) Disorganisation symptom severity at baseline (mean 0.4 [sd=0.29; N=65] versus 0.43 [sd=0.33; N=34]; *MD -0.03 [-0.16, 0.10]; p=0.65)* or change at 15-month follow-up (mean 0.33 [sd=0.29; N=50] versus 0.23 [sd=0.34; N=21]*; MD 0.10 [-0.07, 0.27]; p=0.24*) Depression symptom severity at baseline (mean 13.02 [sd=8.87; N=65] versus 14.32 [sd=8.81; N=34]; *MD -1.30 [-4.96, 2.36];*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			p=0.49) or change at 15-month follow-up (mean 8.59 [sd=9.54; N=50] versus 7.48 [sd=9.45; N=21]*; MD 1.11 [-3.72, 5.94]; p=0.65*) Affective symptom severity at baseline (mean 8.7 [sd=10.09; N=65] versus 8.65 [sd=10.21; N=34]; *MD 0.05 [-4.17, 4.27]; p=0.98)* or change at 15-month follow-up (mean 6.75 [sd=11.24; N=50] versus 5.24 [sd=10.99; N=21]*; MD 1.51 [-4.13, 7.15]; p=0.60*) Change in adherence to medication at 15-month follow-up (mean 0.13 [sd=2.77; N=50] versus 0.71 [sd=1.74; N=21]; *MD -0.58 [-1.65, 0.49]; p=0.29*) Change in social function at 15-month follow-up (mean 2.26 [sd=9.3; N=50] versus -0.22 [sd=9.51; N=21]; *MD 2.48 [-2.34, 7.30]; p=0.31*) Duration of untreated psychosis (mean 38.82 [sd=75.19; N=65] versus 49.29 [sd=79; N=34]; *MD -10.47 [-42.71, 21.77]; p=0.52*) Duration of untreated prodrome (mean 86.34 [sd=128.72; N=65] versus 76.42 [sd=142.8; N=34]; *MD 9.92 [-47.38, 67.22]; p=0.73*) Number of days spent in hospital during index admission (mean 55 [sd=73; N=50] versus 66 [sd=75; N=21]; *MD -11.00 [-48.93, 26.93]; p=0.57*) Number of days spent in hospital during the first 2 years of illness (mean 118 [sd=148; N=50] versus	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			94 [sd=99; N=21]; *MD 24.00 [-34.96, 82.96]; p=0.42*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Manning et al. 2002 Manning VC, Strathdee G, Best D, Keaney F, McGillivray L, Witton J. Dual diagnosis screening: preliminary findings on the comparison of 50 clients attending community mental health services and 50 clients attending community substance misuse services. Journal of Substance Use. 2002;7:221-28. Cohort (-)	Clinical staff working with substance misuse clients in Bromley, south London were asked to screen all their current caseloads (regardless of their clinical judgements on who would be screened positive for dual diagnosis) and the first 50 screens were included. Participants were excluded if they were: (1) verbally impaired; (2) in a catatonic state; (3) were age <16 years or >64 years London (south); Suburban N: 50 (Study also included N=50 screened in CMHT but this data could not be included as not specific to SMI) Year/s of data collection NR Substance misuse services; First 50 clients screened who were attending substance misuse agencies (statutory drug services and a voluntary alcohol advisory service). SMI method of assessment: Clinical staff used a five-item screen for psychosis, the 'Bebbington Psychosis Questionnaire' (Bebbington & Nayani, 1995) Substance misuse method of assessment; timescale: NR (based on being treated in alcohol and drug services); Current Age (years): NR (for subsample)	Prevalence of dual diagnosis: Positive screen for psychosis (Bebbington Psychosis Questionnaire) amongst substance misuse service clients	Prevalence of dual diagnosis (*combined data from drug and alcohol services and calculated event rate from percentage*): *34% (17/50)*	Identified by authors: (1) Screens represent only a proportion of the total caseload (2) Sample size is limited (3) Concerns with sampling bias and case selection as initial screens were not consecutive appointments and hence may have been carried out on the more approachable and salient cases (4) Screening questions based on core symptoms relating to disorder and thus further assessment is needed to ascertain clear clinical status for dual diagnosis Identified by review team: (1) Restricted to those in contact with substance misuse services (2) Data could not be extracted for the CMHT sample as not specific to SMI and not possible to extract data for only the SMI subsample (3) Prevalence of psychosis in substance misuse settings made on the basis of screening questionnaire with no objective confirmation of diagnosis (4) Potential for sampling bias and case selection as initial screens were not consecutive appointments (5) Small sample size

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Gender (% female): NR (for subsample) Ethnicity (% white): NR (for subsample)			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
McCreadie 2002 [Scottish Comorbidity Study] McCreadie R. Use of drugs, alcohol and tobacco by people with schizophrenia: case—control study. The British Journal of Psychiatry. 2002;181:321-25. Case-control (++)	Participants were included if they: (1) had a consensus diagnosis of schizophrenia based on ICD-10 research diagnostic criteria; (2) were aged at least 16 years; (3) were known to primary or secondary care services in one of three sites: Nithsdale (a rural area in south-west Scotland); west Glasgow (inner-city); and a suburban area of Aberdeen Scotland; Mixed N: 500 Year/s of data collection NR Comprehensive catchment area survey (using 'key informant' method to identify participants with schizophrenia known to primary or secondary care services) SMI method of assessment: Consensus clinical diagnosis of schizophrenia and case records examined to complete the Operational Checklist for Psychiatric Disorders (OPCRIT) to generate ICD-10 and DSM-IV diagnoses Substance misuse method of assessment; timescale: ICD-10 diagnosis of harmful drug use, drug dependence or problem drug use (measured using sections 11 and 12 of SCAN); 1 year Age (years): Range NR (mean: 45)	Prevalence of dual diagnosis: ICD-10 diagnosis of harmful drug use, drug dependence or problem drug use in past year/any time before previous year; ICD-10 diagnosis of harmful alcohol use, alcohol dependence or problem alcohol use in past year/any time before previous year	Schizophrenic patients versus general population controls (matched on gender, age and postcode area of residence; *Data combined for harmful use, dependence and problem use; compared groups using the Mantel-Haenszel method*): *Statistically significant differences between groups, with higher rates in the schizophrenia group:* Harmful drug use, drug dependence or problem drug use in past year (*49/250 versus 12/250; OR 4.83 [2.50, 9.34]; p<0.00001*) Harmful drug use, drug dependence or problem drug use anytime before previous year (*136/250 versus 38/250; OR 6.66 [4.35, 10.19]; p<0.00001*) Harmful alcohol use, alcohol dependence or problem alcohol use in past year (*100/250 versus 55/250; OR 2.36 [1.60, 3.50]; p<0.0001*) Harmful alcohol use, alcohol dependence or problem alcohol use anytime before previous year (*243/250 versus 189/250; OR 11.20 [5.01, 25.06]; p<0.00001*)	Identified by authors: (1) Success in identifying patients was probably greater in the rural than in the urban or suburban areas (2) Detailed interviews of subjects by a research nurse and brief interviews by keyworkers produced conflicting results (3) In a small sample of controls who did not report drug use, hair analysis suggested otherwise Identified by review team: (1) Restricted to those known to primary or secondary care services (2) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Gender (% female): 43 Ethnicity (% white): NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
McManus et al. 2009 [APMS, 2007] McManus S, Meltzer H, Brugha T, Bebbington P, Jenkins R. Adult psychiatric morbidity in England, 2007: results of a household survey. United Kingdom. The NHS Information Centre for Health and Social Care. 2009. Cohort (+)	Adult Psychiatric Morbidity Survey 2007 (APMS 2007) is the third in a series of general population surveys of adult mental health. The 2007 survey was carried out by National Centre for Social Research (NatCen) in collaboration with the University of Leicester, and was commissioned by the NHS Information Centre for health and social care. The APMS 2007 covered England only, and removed the upper age limit to participation (74 years). The sample for APMS 2007 was designed to be representative of the population living in private households (that is, people not living in communal establishments) in England England; Mixed N: 7461 Data collected: 2006-2007 Comprehensive catchment area survey SMI method of assessment: ICD-10 diagnosis of psychotic disorder (assessed using SCAN; past year) Substance misuse method of assessment; timescale: Alcohol dependence (screen positive on AUDIT and community version of SADQ [SADQ-C]); 6 months Age (years): NR	Relationship between SMI and substance misuse: Tetrachoric correlation between psychotic disorder (ICD-10 assessed using SCAN; past year) and alcohol dependence (screen positive on AUDIT and SADQ-C; past 6 months); Tetrachoric correlation between psychotic disorder and drug dependence (screen positive based on Diagnostic Interview Schedule; past year)	Tetrachoric correlation between psychotic disorder and alcohol dependence: 0.25 Tetrachoric correlation between psychotic disorder and drug dependence: 0.4	Identified by authors: NR Identified by review team: (1) Data could only be extracted for association (correlation) between psychosis and substance misuse

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Gender (% female): NR Ethnicity (% white):NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Miles et al. 2003 [COMO study] Miles H, Johnson S, Amponsah-Afuwape S, Finch E, Leese M, Thornicroft G. Characteristics of subgroups of individuals with psychotic illness and a comorbid substance use disorder. Psychiatric Services. 2014;54:554-61. Case-control (-)	Thirteen community mental health teams participated. One of these teams is a specialist team for the homeless mentally ill population of South London, and each of the others is responsible for all individuals with a SMI who live in the geographic catchment area served by the team. Case managers participated in the study unless they were temporary staff or had firm plans to leave their jobs during the next 18 months. This was a nested case-control study comparing across substance-of-choice subgroups (alcohol only, alcohol and cannabis, cannabis only, stimulants) London; Urban N: 1560 Data collected: 1999-2000 Secondary mental health care; Caseloads of CMHTs SMI method of assessment: ICD-10 diagnosis (made by psychiatrists and recorded in case notes) of schizophrenia, schizoaffective disorder, bipolar affective disorder, or delusional disorder Substance misuse method of assessment; timescale: Rating of substance abuse, dependence or dependence with institutionalization based on Alcohol Use Scale (AUS)	Prevalence of dual diagnosis: ICD-10 diagnosis of psychotic illness (from case notes) and were rated by staff as abusing or dependent on at least one substance (using the Clinician Alcohol Use Scale [CAUS] or the Clinician Drug Use Scale [CDUS]) Characteristics of dual diagnosis: ICD-10 diagnosis of schizophrenia/bipolar affective disorder (from case notes) Prevalence of health and social care needs: Camberwell Assessment of Needs Short Assessment Schedule (CANSAS): Number of unmet needs Prevalence of health care needs: Service utilisation (Client Service Receipt Inventory: Admission as an inpatient in the past 18 months/Mean number of days admitted in the past 18 months [based on best available information from patients, staff and case notes]); Suicide (Study-specific Clinical and Social History Scale [CSHS]: Ever harmed self [based on best available information from patients, staff and case notes]) Prevalence of social care needs: Housing (number currently homeless based on best available information from patients, staff and case notes); Employment (number currently unemployed based on best available information from patients, staff and case notes); Violence (CSHS: Ever committed a violent act [based on best available information from patients, staff and case notes])	Prevalence of dual diagnosis (duplicate data from Afuwape 2006): *14.94%* (233/1560) Characteristics of dual diagnosis *(% of dual diagnosis sample; calculated across substance-use subgroups*): *71.50% (153/214)* schizophrenia *11.21% (24/214)* bipolar affective disorder Health and social care needs (*calculated across substance-use subgroups*): CANSAS mean number of unmet needs: *5.59 (sd=2.96)* Health care needs *(% of dual diagnosis sample; calculated across substance-use subgroups*): *58.22% (124/213)* admitted as an inpatient in the past 18 months Mean number of days admitted in the past 18 months: *76.86 (sd=120.12)* *28.97% (62/214)* had ever harmed self Social care needs *(% of dual diagnosis sample; calculated across substance-use subgroups*): *3.32% (7/211)* homeless *89.67% (191/213)* unemployed *37.85% (81/214)* had ever committed a violent act Dual diagnosis clients who use only alcohol versus dual diagnosis	Identified by authors: (1) The two ways of classifying the subgroups (based on case managers' ratings only and based on patient interview data only) are not the only options for categorization of substance of choice (2) Toxicologic confirmation of substances used was not obtained (3) Study sample was representative only of patients who were in contact with mental health services (4) The significant findings indicate associations only, and no causal pathways can be inferred (5) The number of patients in each subgroup was relatively small, which diminished statistical power (6) Multiple statistical comparisons and the prominence of schizophrenia in this sample (73 percent) limit the interpretability of the results Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on staff ratings of substance misuse and health and social needs with no objective confirmation (3) Diagnosis of SMI taken from case notes (4) No data available for participants with SMI without substance misuse (5) Multiple comparisons without statistical correction

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
	and Drug Use Scale (DUS) (Drake et al., 1990); 6 months Age (years): 17-77 (mean: 37.5) Gender (% female): 17 Ethnicity (% white): 49		clients who use alcohol and cannabis (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with higher rates for the alcohol and cannabis group (relative to alcohol-only) for:* Number admitted as an inpatient in the past 18 months (*39/78 versus 35/52; OR 0.49 [0.23, 1.01]; p=0.05*) *Non-statistically significant difference between alcohol-only and alcohol and cannabis groups in:* Diagnosis of schizophrenia (55/78 versus 39/52; *OR 0.80 [0.36, 1.76]; p=0.58*) Diagnosis of bipolar affective disorder (10/78 versus 5/52; *OR 1.38 [0.44, 4.31]; p=0.58*) Number currently homeless (5/78 versus 0/52; *OR 7.86 [0.43, 145.19]; p=0.17*) Number currently unemployed (70/78 versus 46/52; *OR 1.14 [0.37, 3.50]; p=0.82*) Mean number of days admitted as an inpatient in the past 18 months (mean 61 [sd=106.3; N=78] versus 95.2 [sd=131.3; N=52]; *MD -34.20 [-76.98, 8.58]; p=0.12*) Number who had ever self-harmed (23/78 versus 12/52; *OR 1.39 [0.62,*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			3.13]; p=0.42) Number who had ever committed a violent act (24/78 versus 20/52; *OR 0.71 [0.34, 1.49]; p=0.36*) CANSAS mean number of unmet needs (mean 5.9 [sd=3; N=78] versus 5.6 [sd=2.7; N=52]; *MD 0.30 [-0.69, 1.29]; p=0.55*) Dual diagnosis clients who use only alcohol versus dual diagnosis clients who use cannabis only (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Non-statistically significant differences between alcohol-only and cannabis-only groups in:* Diagnosis of schizophrenia (55/78 versus 20/29; *OR 1.08 [0.43, 2.71]; p=0.88*) Diagnosis of bipolar affective disorder (10/78 versus 4/29; *OR 0.92 [0.26, 3.20]; p=0.89*) Number currently homeless (5/78 versus 0/29; *OR 4.41 [0.24, 82.39]; p=0.32*) Number currently unemployed (70/78 versus 24/29; *OR 1.82 [0.54, 6.11]; p=0.33*) Number admitted as an inpatient in the past 18 months (39/78 versus 19/29; *OR 0.53 [0.22, 1.28]; p=0.16*) Mean number of days admitted as an inpatient in the past 18 months	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			(mean 61 [sd=106.3; N=78] versus 76.7 [sd=114.7; N=29]; *MD -15.70 [-63.65, 32.25]; p=0.52*) Number who had ever self-harmed (23/78 versus 7/29; *OR 1.31 [0.49, 3.50]; p=0.58*) Number who had ever committed a violent act (24/78 versus 8/29; *OR 1.17 [0.45, 3.00]; p=0.75*) CANSAS mean number of unmet needs (mean 5.9 [sd=3; N=78] versus 4.7 [sd=3.4; N=29]; *MD 1.20 [-0.21, 2.61]; p=0.09*) Dual diagnosis clients who use only alcohol versus dual diagnosis clients who use stimulants only (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with higher rates in stimulant-only group (relative to alcohol-only) for:* Number who had ever committed a violent act (24/78 versus 29/55; *OR 0.40 [0.19, 0.81]; p=0.01*) *Non-statistically significant differences between alcohol-only and stimulant-only groups in:* Diagnosis of schizophrenia (55/78 versus 39/55; *OR 0.98 [0.46, 2.09]; p=0.96*) Diagnosis of bipolar affective disorder (10/78 versus 5/55; *OR*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			1.47 [0.47, 4.57]; p=0.51) Number currently homeless (5/78 versus 2/55; *OR 1.82 [0.34, 9.71]; p=0.49*) Number currently unemployed (70/78 versus 51/55; *OR 0.69 [0.20, 2.40]; p=0.56*) Number admitted as an inpatient in the past 18 months (39/78 versus 31/55; *OR 0.77 [0.39, 1.55]; p=0.47*) Mean number of days admitted as an inpatient in the past 18 months (mean 61 [sd=106.3; N=78] versus 82.1 [sd=130; N=55]; *MD -21.10 [-62.78, 20.58]; p=0.32*) Number who had ever self-harmed (23/78 versus 20/55; *OR 0.73 [0.35, 1.52]; p=0.40*) CANSAS mean number of unmet needs (mean 5.9 [sd=3; N=78] versus 5.6 [sd=2.9; N=55]; *MD 0.30 [-0.72, 1.32]; p=0.56*) Dual diagnosis clients who use alcohol and cannabis versus dual diagnosis clients who use cannabis only (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Non-statistically significant differences between alcohol and cannabis group and cannabis-only group in:* Diagnosis of schizophrenia (39/52 versus 20/29; *OR 1.35 [0.49, 3.69];*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			p=0.56) Diagnosis of bipolar affective disorder (5/52 versus 4/29; *OR 0.66 [0.16, 2.70]; p=0.57*) Number currently homeless (0/52 versus 0/29; *OR not estimable*) Number currently unemployed (46/52 versus 24/29; *OR 1.60 [0.44, 5.78]; p=0.48*) Number admitted as an inpatient in the past 18 months (35/52 versus 19/29; *OR 1.08 [0.41, 2.83]; p=0.87*) Mean number of days admitted as an inpatient in the past 18 months (mean 95.2 [sd=131.3; N=52] versus 76.7 [sd=114.7; N=29]; *MD 18.50 [-36.42, 73.42]; p=0.51*) Number who had ever self-harmed (12/52 versus 7/29; *OR 0.94 [0.32, 2.74]; p=0.91*) Number who had ever committed a violent act (20/52 versus 8/29; *OR 1.64 [0.61, 4.40]; p=0.33*) CANSAS mean number of unmet needs (mean 5.6 [sd=2.7; N=52] versus 4.7 [sd=3.4; N=29]; *MD 0.90 [-0.54, 2.34]; p=0.22*) Dual diagnosis clients who use alcohol and cannabis versus dual diagnosis clients who use stimulants only (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Non-statistically significant*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			differences between alcohol and cannabis group and stimulant-only group in: Diagnosis of schizophrenia (39/52 versus 39/55; *OR 1.23 [0.52, 2.90]; p=0.63*) Diagnosis of bipolar affective disorder (5/52 versus 5/55; *OR 1.06 [0.29, 3.91]; p=0.93*) Number currently homeless (0/52 versus 2/55; *OR 0.20 [0.01, 4.35]; p=0.31*) Number currently unemployed (46/52 versus 51/55; *OR 0.60 [0.16, 2.27]; p=0.45*) Number admitted as an inpatient in the past 18 months (35/52 versus 31/55; *OR 1.59 [0.73, 3.50]; p=0.25*) Mean number of days admitted as an inpatient in the past 18 months (mean 95.2 [sd=131.3; N=52] versus 82.1 [sd=130; N=55]; *MD 13.10 [-36.44, 62.64]; p=0.60*) Number who had ever self-harmed (12/52 versus 20/55; *OR 0.53 [0.22, 1.23]; p=0.14*) Number who had ever committed a violent act (20/52 versus 29/55; *OR 0.56 [0.26, 1.21]; p=0.14*) CANSAS mean number of unmet needs (mean 5.6 [sd=2.7; N=52] versus 5.6 [sd=2.9; N=55]; *MD 0.00 [-1.06, 1.06]; p=1.00*) Dual diagnosis clients who use cannabis only versus dual diagnosis clients who use stimulants only (*compared groups*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes): *Statistically significant difference between groups, with higher rates in stimulant group (relative to cannabis group) for:* Number who had ever committed a violent act (8/29 versus 29/55; *OR 0.34 [0.13, 0.90]; p=0.03*) *Non-statistically significant differences between cannabis and stimulants groups in:* Diagnosis of schizophrenia (20/29 versus 39/55; *OR 0.91 [0.34, 2.43]; p=0.85*) Diagnosis of bipolar affective disorder (4/29 versus 5/55; *OR 1.60 [0.39, 6.49]; p=0.51*) Number currently homeless (0/29 versus 2/55; *OR 0.36 [0.02, 7.81]; p=0.52*) Number currently unemployed (24/29 versus 51/55; *OR 0.38 [0.09, 1.53]; p=0.17*) Number admitted as an inpatient in the past 18 months (19/29 versus 31/55; *OR 1.47 [0.58, 3.74]; p=0.42*) Mean number of days admitted as an inpatient in the past 18 months (mean 76.7 [sd=114.7; N=29] versus 82.1 [sd=130; N=55]; *MD -5.40 [-59.47, 48.67]; p=0.84*) Number who had ever self-harmed (7/29 versus 20/55; *OR 0.56 [0.20,*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			1.53]; p=0.26) CANSAS mean number of unmet needs (mean 4.7 [sd=3.4; N=29] versus 5.6 [sd=2.9; N=55]; *MD -0.90 [-2.36, 0.56]; p=0.23*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Priebe et al. 2003/Fakhoury & Priebe 2006 [Pan-London Assertive Outreach Study] Priebe S, Fakhoury W, Watts J, Bebbington P, Burns T, Johnson S et al. Assertive outreach teams in London: patient characteristics and outcomes Pan-London Assertive Outreach Study, Part 3. The British Journal of Psychiatry. 2003:183;148-54. Fakhoury WKH, Priebe S. An unholy alliance: substance abuse and social exclusion among assertive outreach patients. Acta Psychiatrica Scandinavica. 2006;114:124-31. Cohort (++)	Participants were sampled from all 24 mental health services in Greater London that operated assertive outreach teams. The caseload for each team was divided into patients who had been with the team for 3 months or longer ('established') and those who had joined the caseload in the previous 3 months ('new'). The sample consisted of all new patients and a random 0.37 fraction of established patients from each team London; Urban N: 580 Data collected: 2001 Secondary mental health care; Assertive outreach teams SMI method of assessment: Diagnosis of SMI (from case notes) Substance misuse method of assessment; timescale: Clinician rated scales (CRSs) on alcohol or drug use (Drake et al., 1989) Age (years): Range NR (mean: 36.7) Gender (% female): 37 Ethnicity (% white):56	Prevalence of dual diagnosis: Diagnosis of SMI (from case notes) and staff-rated substance misuse Characteristics of dual diagnosis: Drake (1989) schedule: Alcohol/cannabis/cocaine or crack/stimulant/opiate/ecstasy/ hallucinogen/solvent use problem (abuse, dependence and severe dependence) in past 6 months; Clinical diagnosis of schizophrenia (case note review) Prevalence of health care needs: Service utilisation (Contact with other mental health services in the past 3 months [case note review]; Hospitalised/Compulsorily hospitalised in the last 2 years [case note review]); Suicide (Number of participants who have committed acts of parasuicide in last 2 years [case note review]) Prevalence of social care needs: Employment (Number not in paid employment/student [case note review]); Housing (History of homelessness in last 2 years [case note review]); Violence (Number of participants who have committed physical violence in last 2 years [case note review]); Contact with criminal justice system (Number of participants with history of arrests in last 2 years [case note review])	Prevalence of dual diagnosis (*calculated event rate from percentage*): 29% (*168*/580) Characteristics of dual diagnosis *(calculated as % of dual diagnosis sample)*: *50.60% (85/168)* alcohol use problem *51.79% (87/168)* cannabis use problem *23.81% (40/168)* cocaine/crack use problem *5.95% (10/168)* stimulant use problem *4.17% (7/168)* opiate use problem *2.98% (5/168)* ecstasy use problem *2.38% (4/168)* hallucinogen use problem *1.79% (3/168)* solvent use problem Alcohol abuse/dependence versus no alcohol use or used alcohol without impairment (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in alcohol abuse/dependence group for:* Number not in paid employment/student (82/85 versus 371/437; *OR 4.86 [1.49, 15.85]; p=0.009*) Physical violence (44/85 versus 137/437; *OR 2.35 [1.47, 3.76]; p=0.0004*) Recent history of arrests (30/85	Identified by authors: (1) Teams were taken from across London and results cannot be generalized directly to the whole of the UK (whether urban or non-urban areas) (2) Analyses do not allow establishing the direction of the association (cause and effect) between substance abuse and factors of social exclusion (3) No formal research diagnosis concerning substance abuse was established, as information on this was obtained from scales rated by the care coordinators (or clinicians) Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on staff ratings of substance misuse with no objective confirmation (3) Diagnosis of SMI and social needs outcomes taken from case notes

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			versus 71/437; *OR 2.81 [1.68, 4.69]; p<0.0001*) Contact with other mental health services (36/85 versus 134/437; *OR 1.66 [1.03, 2.67]; p=0.04*) *Non-statistically significant difference between alcohol abuse/dependence and no alcohol abuse/dependence groups in*: Diagnosis of schizophrenia (57/85 versus 320/437; *OR 0.74 [0.45, 1.23]; p=0.25*) Number of participants with recent history of homelessness (6/85 versus 17/437; *OR 1.88 [0.72, 4.91]; p=0.20*) Acts of parasuicide (12/85 versus 38/437; *OR 1.73 [0.86, 3.46]; p=0.12*) Hospitalized (63/85 versus 312/437; *OR 1.15 [0.68, 1.94]; p=0.61*) Compulsorily hospitalized (44/85 versus 233/437; *OR 0.94 [0.59, 1.50]; p=0.79*) Drug abuse/dependence versus no drug use or used drugs without impairment (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in drug abuse/dependence group for:* Number not in paid employment/student (96/103 versus	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			354/416; *OR 2.40 [1.06, 5.42]; p=0.03*) Recent history of homelessness (11/103 versus 12/416; *OR 4.03 [1.72, 9.41]; p=0.001*) Physical violence (56/103 versus 127/416; *OR 2.71 [1.75, 4.21]; p<0.00001*) Recent history of arrests (45/103 versus 58/416; *OR 4.79 [2.97, 7.72]; p<0.00001*) Number hospitalized in past 2 years (88/103 versus 290/416; *OR 2.55 [1.42, 4.58]; p=0.002*) Number compulsorily hospitalized in past 2 years (70/103 versus 210/416; *OR 2.08 [1.32, 3.28]; p=0.002*) *Non-statistically significant difference between drug abuse/dependence and no drug abuse/dependence groups in*: Diagnosis of schizophrenia (80/103 versus 295/416; *OR 1.43 [0.86, 2.38]; p=0.17*) Acts of parasuicide (10/103 versus 38/416; *OR 1.07 [0.51, 2.23]; p=0.86*) Contact with other mental health services (32/103 versus 132/416; *OR 0.97 [0.61, 1.54]; p=0.90*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Rao et al. 2007/Trathen et al. 2007 Rao H, Luty J, Trathen B. Characteristics of patients who are violent to staff and towards other people from a community mental health service in South East England. Journal of Psychiatric & Mental Health Nursing. 2007;14:753-57. Trathen B, O'Gara C, Sarkhel A, Sessay M, Rao H, Luty J. Co-morbidity and cannabis use in a mental health trust in South East England. Addictive Behaviors. 2007;32:2164-77. Case-control (-)	Participants were included if they: (1) were aged 16-64 years; (2) were being actively care coordinated by inpatient services, CMHTs, drug and alcohol services or psychiatric outpatient services (random sample) in the North Essex mental health partnership NHS trust Harlow and surrounding area of South East England; Semi-rural N: 1808 Data collected: 2002 Mixed service settings; All inpatients (5%), all CMHT patients (50%), all patients from the drug and alcohol service (13%), and a random sample of psychiatric outpatients (32%) SMI method of assessment: Diagnosis of psychotic disorder based on the working diagnosis made by the appropriate multidisciplinary team (including schizophrenia, bipolar affective disorder and severe depression) or any mental disorder if it was associated with a high risk of self-harm or violence Substance misuse method of assessment; timescale: Substance use disorder (no further detail reported); Current Age (years): 16-64 (mean NR for	Prevalence of dual diagnosis: Diagnosis of severe mental illness (psychotic disorder or any mental disorder if it was associated with a high risk of self-harm or violence) and substance use disorder (from case notes)	Prevalence of dual diagnosis: *61.23%* (1107/1808) of caseload of mental health partnership NHS trust *21.67%* (70/323) of CMHT caseload *24%* (12/50) and *22%* (11/50) of Community Drug and Alcohol Service (CDAT) caseload for SMI and minor or severe substance use disorder, or SMI and severe substance use disorder respectively Patients attending CMHT with history of violence (any conscious action against a person that produced injury including bruising) versus patients attending CMHT with no history of violence (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference, with higher rates in the history of violence group:* Prevalence of dual diagnosis (108/140 versus 144/319; *OR 4.10 [2.61, 6.44]; p<0.00001*)	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health or substance misuse services (2) Diagnostic data were based on the working diagnosis made by the appropriate multidisciplinary team (3) Recruitment and methodology for the case-control phase of the study unclear (4) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	whole sample) Gender (% female): NR (for whole sample) Ethnicity (% white): NR (for whole sample)			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Rowlands 2001 Rowlands RP. Auditing first episode psychosis: giving meaning to clinical governance. International Journal of Clinical Practice. 2001;55:669-72. Cohort (-)	Participants were included if they: (1) had first episodes of psychosis and had not had previous service contact; (2) had delusions or hallucinations or other psychotic phenomena; (3) were aged 17 years or over; (4) their symptoms were not occurring as the secondary feature of a primary dementing illness; (5) their psychotic symptoms were not directly related to concurrent intoxication with a psychoactive substance North Derbyshire; Mixed N: 84 Data collected: 1999-2000 Secondary mental health care; Catchment area survey (using 'key informant' method to identify incident cases of psychosis known to CMHTs and consultants [CMHTs and consultants made aware of the project and encouraged to refer names of any individual suspected of having a first episode of psychosis]) SMI method of assessment: Diagnosis of psychosis (collected from the clinicians involved in delivering assessments and intervention to the individuals concerned) Substance misuse method of	Prevalence of dual diagnosis: Substance misuse ever/recent (from case notes) Characteristics of dual diagnosis: Diagnosis of schizophrenia spectrum/affective psychosis/drug- or alcohol-induced psychosis/organic psychosis (from case notes) amongst current substance misusers	Prevalence of dual diagnosis (*combined across psychotic diagnoses*): *46.43% (39/84)* current; *51.19% (43/84)* lifetime Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample for current substance misuse group*): *35.90% (14/39)* schizophrenia spectrum *10.26% (4/39)* affective psychosis *48.72% (19/39)* substance-induced psychosis (*combined drug-induced and alcohol-induced*) *5.13% (2/39)* organic psychosis	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Diagnosis of SMI and substance misuse taken from case notes (3) No sub-analyses possible (4) Small sample size

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	assessment; timescale: Substance misuse (from case notes); Current and lifetime Age (years): 17-71 (mean NR; medians: 21-43) Gender (% female): 42 Ethnicity (% white): NR			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
Schulte & Holland 2008 Schulte S, Holland, M. Dual diagnosis in Manchester, UK: Practitioners' estimates of prevalence rates in mental health and substance misuse services. Mental Health and Substance Use: Dual Diagnosis. 2008;1:118-24. Cohort (-)	Inclusion/exclusion criteria NR Manchester; Urban N: 2454 Data collected: 2003 Secondary mental health care; Secondary analysis of internal Trust reports (survey sent to all CMHTs, the assertive outreach and home option team) SMI method of assessment: Revised MARC II questionnaire (simple one-page form to gather client details, e.g. type of mental illness, drug/alcohol use and level of engagement). Secondary data from survey was not specific to SMI but majority had SMI (at least 81%) Substance misuse method of assessment; timescale: Misuse of drugs and/or alcohol (outcome measure NR); timescale NR Age (years): NR Gender (% female): NR Ethnicity (% white): NR	Prevalence of dual diagnosis: Misuse of drugs and/or alcohol (outcome measure NR) Characteristics of dual diagnosis: Staff-reported moderate to heavy alcohol problems (based upon recent past); Staff-reported moderate to heavy drug use (based upon recent past) Prevalence of health care needs: Service satisfaction (Poor engagement with services; study-specific survey rated by care coordinator)	Prevalence of dual diagnosis (*calculated event rates from percentages and combined alcohol and drug use groups*): *35.13% (862/2454)* Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *71.23% (614/862)* moderate to heavy alcohol problems *56.96% (491/862)* moderate to heavy drug use Health care needs (*calculated as % of dual diagnosis sample*): *16.24% (140/862)* poor engagement with services	Identified by authors: NR Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Limited methodological details, including the measures used to ascertain diagnosis of SMI (staff-reported or from case notes) and substance misuse (3) This study also gathered primary data from telephone interviews with local mental health and drug/alcohol services but this data could not be used as it was not specific to SMI (4) In addition to the 2003 survey, the same survey was repeated in 2005, however, outcome data from the 2005 survey was not reported

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Turkington et al. 2009 [NIFEPS] Turkington A, Mulholland CC, Rushe TM, Anderson R, McCaul R, Barrett SL, et al. Impact of persistent substance misuse on 1-year outcome in first-episode psychosis. British Journal of Psychiatry. 2009;195:242-48. Case-control (++)	Participants were included if they: (1) were aged 18-64 years old; (2) had lived in Northern Ireland for the 6 months prior to presentation; (3) provided available data at baseline and one-year follow-up. Participants were excluded if they: (1) had previous psychotic diagnoses Belfast City and County Antrim area; Mixed N: 188 Data collected: 2003-2004 Secondary mental health care; All incident cases of psychosis presenting to general psychiatric services SMI method of assessment: ICD-10 diagnosis of psychosis (based on case note analysis using the OPCRIT) Substance misuse method of assessment; timescale: Substance abuse or dependence based on Psychiatric and Personal History Schedule (PPHS); 1 year Age (years): 18-64 (mean: 34.2) Gender (% female): 37 Ethnicity (% white): NR	Prevalence of dual diagnosis: Diagnosis of psychosis (from clinical case notes) and rating of substance abuse or dependence in previous year based on Psychiatric and Personal History Schedule (PPHS) Characteristics of dual diagnosis: Alcohol/Cannabis abuse or dependence in previous year based on PPHS Gender variation: Number of females Age variation: Age at presentation (years) Prevalence of health care needs: Symptom severity (Positive and Negative Symptom Scale [PANSS]: Positive/Negative symptoms; self-report; number of items and min/max score range NR; lower better); Symptom duration (Duration of untreated psychosis [DUP] estimated from case notes and PPHS: Number of participants with long (>6 month) DUP); Relapse (estimated from case notes and PPHS: Symptomatic relapse following a period of remission or no remission of symptoms within first year); Medication adherence (estimated from case notes and PPHS: Number of participants with poor adherence [lapses of 3 or more days more than once, or not taking any prescribed medication]; medication type NR)	Prevalence of dual diagnosis (*calculated event rate from percentage*): *43%* (*81*/188) for psychosis; 50.5% (52/103) for schizophrenia Characteristics of dual diagnosis (*calculated event rates from percentages and calculated as % of dual diagnosis sample*): *76.54% (62/81)* alcohol abuse or dependence for psychosis *98.08% (51/52)* alcohol abuse or dependence for schizophrenia *48.15% (39/81)* cannabis abuse or dependence for psychosis *51.92% (27/52)* cannabis abuse or dependence for schizophrenia Psychosis and substance misuse versus psychosis and never misused substances (*combined stopped and persistent substance misuse groups as measure at baseline*; *compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with lower rates in the dual diagnosis group:* Number of females (*19/83* versus 51/105; *OR 0.31 [0.17, 0.60]; p=0.0004*) Age at presentation (*mean: 30.70 [sd=10.90]* versus 36.9 [sd=12.6]; *MD -6.20 [-9.57, -2.84]; p=0.0003*)	Identified by authors: (1) Unable to precisely quantify drug use (2) A significant number of individuals recruited to the study were lost to follow-up (3) The use of OPCRIT to obtain a diagnosis does not allow for a specific category of 'drug-induced psychosis' and it is possible that the stopped group may contain an excess of participants with drug-induced psychosis, representing individual brief psychotic episodes that resolve on cessation of drug use and are associated with a better prognosis Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Multiple comparisons with no statistical correction (3) Diagnosis of SMI taken from case notes (4) Data cannot be extracted for all outcomes as number of participants unclear

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			Non-statistically significant differences between groups in: Number of participants with long (>6 month) DUP (*45/83* versus 48/105; *OR 1.41 [0.79, 2.51]; p=0.25*) Positive symptom severity (*mean 18.14 [sd=7.06; N=83*] versus 16.78 [sd=*5.94*; N=105]; *MD 1.36 [-0.54, 3.26]; p=0.16*) Negative symptom severity (*mean 14.15 [sd=6.06; N=83]* versus 13.22 [sd=*5.12*; N=105]; *MD 0.93 [-0.70, 2.56]; p=0.27*) Psychosis and persistent (baseline and 1-year follow-up) substance misuse versus psychosis and never misused substances (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in persistent substance misuse and psychosis (relative to no substance misuse and psychosis):* Number of participants with poor medication adherence (*21*/43 versus *18*/105; *OR 4.61 [2.11, 10.11]; p=0.0001*) Symptomatic relapse (*24*/43 versus *37*/105; *OR 2.32 [1.13, 4.78]; p=0.02*) Psychosis and stopped substance misuse (substance misuse at	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			baseline but not 1-year follow-up) versus psychosis and never misused substances (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Non-statistically significant difference between psychosis and former/stopped substance misuse and psychosis and never substance misuse groups in:* Number of participants with poor medication adherence (*10*/40 versus *18*/105; *OR 1.61 [0.67, 3.87]; p=0.29*) Symptomatic relapse (*13*/40 versus *37*/105; *OR 0.88 [0.41, 1.92]; p=0.76*) Psychosis and persistent (baseline and 1-year follow-up) substance misuse versus psychosis and stopped substance misuse (substance misuse at baseline but not 1-year follow-up) (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in psychosis and persistent misuse group (relative to psychosis and former/stopped substance misuse group) in:* Number of participants with poor medication adherence (*21*/43 versus *10*/40; *OR 2.86 [1.13, 7.28];*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			p=0.03) Symptomatic relapse (*24*/43 versus *13*/40; *OR 2.62 [1.07, 6.42]; p=0.03*) Psychosis and substance misuse (at 1-year follow-up) versus psychosis and no substance misuse (at 1-year follow-up) (*combined never and stopped groups for no substance misuse at 1-year follow-up; compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in dual diagnosis group:* Number of participants with poor medication adherence (*21*/43 versus *28/145; OR 3.99 [1.93, 8.25]; p=0.0002*) Symptomatic relapse (*24*/43 versus *50/145; OR 2.40 [1.20, 4.80]; p=0.01*) Schizophrenia and substance misuse versus schizophrenia and never misused substances (*combined stopped and persistent substance misuse groups as measure at baseline*; *compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with lower rates in*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			the dual diagnosis group: Number of females (*12/53* versus 27/50; *OR 0.25 [0.11, 0.58]; p=0.001*) Age at presentation (*mean 27.25 [sd=8.59]* versus 36 [13.7]; *MD -8.75 [-13.20, -4.31]; p=0.0001*) *Non-statistically significant differences between groups in*: Number of participants with long (>6 month) DUP (*29/53* versus 28/50; *OR 0.95 [0.44, 2.07]; p=0.90*) Positive symptom severity (*mean 19.52 [sd=7.20; N=53]* versus 17.37 [sd=6.15; N=50]; *MD 2.15 [-0.43, 4.73]; p=0.10*) Negative symptom severity (*mean 15.33 [sd=6.43; N=53]* versus 14.1 [sd=5.44; N=50]; *MD 1.23 [-1.07, 3.53]; p=0.29*) Schizophrenia and persistent (baseline and 1-year follow-up) substance misuse versus schizophrenia and never misused substances (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in persistent substance misuse and schizophrenia (relative to no substance misuse and schizophrenia):* Number of participants with poor	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			medication adherence (*15*/25 versus *13*/50; *OR 4.27 [1.54, 11.83]; p=0.005*) Symptomatic relapse (*17*/25 versus *19*/50; *OR 3.47 [1.26, 9.58]; p=0.02*) Schizophrenia and stopped substance misuse (substance misuse at baseline but not 1-year follow-up) versus schizophrenia and never misused substances (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Non-statistically significant difference between schizophrenia and stopped substance misuse and schizophrenia and never substance misuse groups in:* Number of participants with poor medication adherence (*6*/28 versus *13*/50; *OR 0.78 [0.26, 2.34]; p=0.65*) Symptomatic relapse (*9*/28 versus *19*/50; *OR 0.77 [0.29, 2.05]; p=0.61*) Schizophrenia and persistent (baseline and 1-year follow-up) substance misuse versus schizophrenia and stopped substance misuse (substance misuse at baseline but not 1-year follow-up) (*calculated event rates from percentages and compared groups using the Mantel-Haenszel*	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			method): *Statistically significant difference between groups, with higher rates in schizophrenia and persistent misuse group (relative to schizophrenia and former/stopped substance misuse group) in:* Number of participants with poor medication adherence (*15*/25 versus *6*/28; *OR 5.50 [1.65, 18.38]; p=0.006*) Symptomatic relapse (*17*/25 versus *9*/28*; OR 4.49 [1.41, 14.25]; p=0.01*) Schizophrenia and substance misuse (at 1-year follow-up) versus schizophrenia and no substance misuse (at 1-year follow-up) (*combined never and stopped groups for no substance misuse at 1-year follow-up; compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates in dual diagnosis group:* Number of participants with poor medication adherence (*15*/25 versus *19/78; OR 4.66 [1.80, 12.08]; p=0.002*) Symptomatic relapse (*17*/25 versus *28/78; OR 3.79 [1.45, 9.90]; p=0.006*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Tyler et al. 2015 Tyler E, Jones S, Black N, Carter LA, Barrowclough C. The Relationship between bipolar disorder and cannabis use in daily life: an experience sampling study. Plos One. 2015;10:e0118916. Cohort (-)	Participants were included if they: (1) met DSM-IV diagnostic criteria for bipolar disorder type I or II, as determined by the Structured Clinical Interview for Axis I Disorders (SCID); (2) reported using cannabis on at least two occasions per week (in at least half the weeks in the 3 months prior to assessment) assessed using the substance use module of the SCID. Participants were excluded if they: (1) met criteria for a current episode of mania or depression (if currently met criteria they were kept on a waiting list until out of episode, except for those who remained unwell throughout the recruitment period); (2) were aged below 18 years; (3) provided evidence of an organic brain disease; (4) had moderate/severe learning disability England (north-west); NR N: 24 Year/s of data collection NR Secondary mental health care; recruited from four mental health trusts in the North-West of England, self-help organisations (Bipolar UK and Mood Swings Network) and self-referral from the online University of Manchester research volunteering website SMI method of assessment: DSM-IV	Relationship between SMI and substance misuse: Multilevel random regression analysis (XTMELOGIT routine for dichotomous variables): Effect of previous positive/negative affect/mania/depression recorded in Experience Sampling Method (ESM) diary (defined as positive/negative affect/mania/depression during the period between previous beep and the beep before that) on cannabis use at the current beep; Multilevel random regression analysis (XTMIXED routine for continuous variables): Effect of cannabis use on subsequent positive/negative affect/manic/depressive symptoms	Association between bipolar disorder and cannabis use: Self-medication effects: Effect of previous positive affect on current cannabis use (OR: 1.25, 95% CI: 1.06–1.47, p = 0.008) Effect of previous negative affect on current cannabis use (OR: 0.88, 95% CI: 0.74–1.05, p = 0.147) Effect of previous mania on current cannabis use (OR: 1.08, 95% CI: 0.93–1.26, p = 0.291) Effect of previous depression on current cannabis use (OR: 0.92, 95% CI: 0.78–1.08, p = 0.303) Cannabis effects on affect and bipolar symptoms: Effect of cannabis use on subsequent positive affect (β = 0.35, 95% CI: 0.20–0.51, p = 0.000) Effect of cannabis use on subsequent negative affect (β = -0.01, 95% CI: -0.13–0.10, p = 0.806) Effect of cannabis use on subsequent manic symptoms (β = 0.20, 95% CI: 0.05–0.34, p = 0.009) Effect of cannabis use on subsequent depressive symptoms (β = 0.17, 95% CI: 0.04–0.29, p = 0.008)	Identified by authors: (1) Details of cannabis use based on self-report (2) The items used on the scales for mania and depression were formulated specifically for use in the Experience Sampling Method (ESM) diary in this study and there is limited evidence for their validity (3) Cannabis is known to have an impact on cognition and this may have impacted on the ability to report information accurately in the diaries (attempted to control for memory bias by using ESM as short space of time between event and recall) (4) ESM can be a demanding methodology and requires sustained attention and motivation to fill out diary entries. This may deter some individuals and result in selection bias (5) Sample size was small and may not generalise to all individuals with co-occurring cannabis use and bipolar disorder (6) Inclusion of a control group (individuals without a mental health diagnosis who regularly used cannabis) in this study may have provided insight into whether the findings of the study relate exclusively to those with a diagnosis of bipolar disorder, compared to a non-clinical sample Identified by review team: (1) Self-report ratings of substance misuse with no objective confirmation (2) Outcome measures largely designed for study and not validated

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	diagnostic criteria for bipolar disorder type I or II, as determined by the SCID Substance misuse method of assessment; timescale: To be included participants were required to report using cannabis on at least two occasions per week (in at least half the weeks in the 3 months prior to assessment) assessed using the substance use module of the SCID Age (years): Range NR (mean: 37.1) Gender (% female): 33 Ethnicity (% white): 92			(3) Sample not representative and potential for selection bias (4) Small sample size (5) Does not report data for SMI clients without substance misuse or substance misuse clients without SMI so no comparison possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Verdolini et al. 2014 Verdolini N, Dean J, Elisei S, Quartesan R, Zaman R, Agius M. Bipolar disorder: The importance of clinical assessment in identifying prognostic factors-An Audit. Part 1: an analysis of potential prognostic factors. Psychiatria Danubina. 2014;26:289-300. Cohort (-)	Participants were included if they: (1) were treatment-seeking adults diagnosed with bipolar disorder; (2) were assessed according to ICD-10 and DSM-IV-TR criteria from 2011 to 2014 by a senior psychiatrist (one of the authors) in his ASPA clinic (Assessment and Single Point of Access, or initial psychiatric assessment); (3) were aged 18-65 years old Bedford; NR N: 70 Data collected: 2011-2014 Secondary mental health care; Treatment-seeking adults with bipolar disorder seen at an initial psychiatric assessment clinic SMI method of assessment: ICD-10/DSM-IV-TR diagnosis of bipolar (from case notes) Substance misuse method of assessment; timescale: Alcohol or illicit drug use (from case notes); Current and lifetime Age (years): 18-61 (mean: 35) Gender (% female): 61 Ethnicity (% white): 94	Prevalence of dual diagnosis: ICD-10/DSM-IV-TR diagnosis of bipolar and current alcohol use (from case notes); ICD-10/DSM-IV-TR diagnosis of bipolar and alcohol use in the past (from case notes); ICD-10/DSM-IV-TR diagnosis of bipolar and current illicit drug use (from case notes); ICD-10/DSM-IV-TR diagnosis of bipolar and illicit drug use in the past (from case notes) Relationship between SMI and substance misuse: Correlation (X^2) between anxiety and current illicit drug use	Prevalence of dual diagnosis: 39.71% (27/68) current alcohol use 49.25% (33/67) lifetime alcohol use 22.58% (14/62) current drug use 56.67% (34/60) lifetime drug use Correlation between anxiety and current illicit drug use: X^2=5.094; p=0.022	Identified by authors: (1) Small sample size (2) All of the patients were outpatients at the ASPA clinic seen by only one of the senior psychiatrists of the clinic Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Diagnosis of SMI and substance use taken from clinical notes (3) Data only reported for substance use with unknown level of impairment (4) Small sample size (5) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Virgo et al. 2001 Virgo N, Bennett G, Higgins D, Bennett L, Thomas P. The prevalence and characteristics of co-occurring serious mental illness (SMI) and substance abuse or dependence in the patients of Adult Mental Health and Addictions Services in eastern Dorset. Journal of Mental Health 2001;10:175-88. Cohort (++)	Participants were included if they: (1) were patients of any adult mental health or addictions service in eastern Dorset on a specific day (15.01.97) Dorset (eastern); Mixed N: 1021 Data collected: 1997 Mixed service settings; All persons who were patients on a specific day (15.01.97) at an acute hospital (10%), residential and day treatment and rehabilitation units (19%), group therapy treatment unit (8%), addictions service including community drug and alcohol teams, a detoxification ward and an abstinence-oriented day treatment unit (31%) and a random sample of patients at CMHTs (33%) SMI method of assessment: Diagnosis of SMI (from case notes) Substance misuse method of assessment; timescale: Keyworker ratings of substance misuse (using Clinician Rating Scales for alcohol and other drugs); 6 months Age (years): NR (for whole sample) Gender (% female): NR (for whole sample) Ethnicity (% white): NR (for whole sample)	Prevalence of dual diagnosis: Diagnosis of SMI (from case notes) and staff ratings of substance misuse (using Clinician Rating Scales for alcohol and other drugs) Characteristics of dual diagnosis: Staff-rated checklist of drugs misused in preceding 6 months: Alcohol/Cannabis/Prescription drugs/ Amphetamines/Opiates/ Benzodiazepines/Sedative-hypnotics/Over- the-counter medications/MDMA/LSD; Diagnosis of schizophrenia/schizo-affective disorder/bipolar disorder/psychotic episodes/depression/anxiety (from case notes) Gender variation: Number of females Prevalence of health care needs: Symptom severity (Number of participants who had experienced ≥1 crises leading to more treatment in the preceding 6 months; reported by keyworker) Prevalence of coexisting conditions: More than one psychiatric diagnosis besides substance abuse/dependence (from case notes) Prevalence of social care needs: Employment (number unemployed; reported by keyworker)	Prevalence of dual diagnosis (*combined across components of services*): 12.05% (123/1021) of patients of adult mental health and addiction services 55% (281/510) of SMI patients of adult mental health and addiction services 12.14% (38/313) of patients of addiction services 11.70% (40/342) of patients of CMHTs Characteristics of dual diagnosis (*calculated event rates from percentages and calculated as % of dual diagnosis sample*): 74% (*91*/123) alcohol misuse 40% (*49*/123) cannabis misuse 17% (*21*/123) prescription drugs misuse 12% (*15*/123) amphetamines misuse 10% (*12*/123) opiates misuse 10% (*12*/123) benzodiazepines misuse 8% (*10*/123) sedative-hypnotics misuse 2% (*2*/123) over-the-counter medications misuse 3% (*4*/123) MDMA misuse 2% (*2*/123) LSD misuse 37.40% (*46*/123) schizophrenia 5.69% (*7*/123) schizo-affective disorder 13.01% (*16*/123) bipolar disorder 2.44% (*3*/123) psychotic episodes 36.59% (*45*/123) depression	Identified by authors: (1) The population sampled was that served on a specific day (2) Ratings of substance misuse are based on the informed report of keyworkers and their knowledge of patients' consumption of psychoactive drugs is likely to be biased towards the problematic (3) Failed to include examination of patients, which could include rigorous research diagnosis and biological indices of substance use Identified by review team: (1) Restricted to those in contact with secondary mental health or substance misuse services (2) Reliance on staff ratings of diagnosis and substance misuse with no objective confirmation (3) No data reported for participants with substance misuse without SMI to allow for comparison

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			13.82% (*17*/123) anxiety SMI with substance abuse/dependence (adult mental health service patients) versus SMI without substance abuse/dependence (adult mental health service patients) (*calculated event rates from percentages and compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with lower rates in dual diagnosis group for:* Number of females (*30*/85 versus *196*/370; *OR 0.48 [0.30, 0.79]; p=0.004*) *Statistically significant difference between groups, with higher rates in dual diagnosis group for:* Number unemployed (*34*/85 versus *89*/370; *OR 2.10 [1.28, 3.45]; p=0.003*) Number with more than one psychiatric diagnosis besides substance abuse/dependence (*13*/85 versus *26*/370; *OR 2.39 [1.17, 4.87]; p=0.02*) Diagnosis of depression (*20*/85 versus *52*/370; *OR 1.88 [1.05, 3.36]; p=0.03*) Number of participants who had experienced ≥1 crises leading to more treatment in the preceding 6 months (*59*/85 versus *155*/370; *OR 3.15 [1.90, 5.22]; p<0.00001*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results ***Results in italics indicate calculations or analysis conducted by the review team*** **Confidence intervals in square brackets are 95% confidence intervals**	Limitations
			Non-statistically significant differences between groups in: Diagnosis of schizophrenia (*44*/85 versus *200*/370; *OR 0.91 [0.57, 1.46]; p=0.70*) Diagnosis of schizo-affective disorder (*5*/85 versus *44*/370; *OR 0.46 [0.18, 1.21]; p=0.11*) Diagnosis of bipolar disorder (*14*/85 versus *41*/370; *OR 1.58 [0.82, 3.06]; p=0.17*) Diagnosis of psychotic episodes (*2*/85 versus *4*/370; *OR 2.20 [0.40, 12.24]; p=0.37*) Diagnosis of anxiety (*6*/85 versus *26*/370; *OR 1.00 [0.40, 2.52]; p=0.99*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Voshaar et al. 2011 [National Confidential Inquiry into Suicide and Homicide by People with Mental Illness] Voshaar RCO, Kapur N, Bickley H, Williams A, Purandare N. Suicide in later life: A comparison between cases with early-onset and late-onset depression. Journal of Affective Disorders. 2011;132:185-91. Case-control (-)	Participants were included if they were: (1) aged 60 years or over at the time of suicide; (2) were given a primary diagnosis of depressive disorder based on ICD-10 criteria by the responding clinician. Participants were excluded if they: (1) had a comorbid diagnosis of dementia or organic brain disorder The study was carried out as part of the National Confidential Inquiry into Suicide and Homicide by People with Mental Illness (Appleby et al., 2001), a complete national clinical sample of all people that had been in contact with mental health services in the 12 months prior to their death by suicide. England and Wales; Mixed N: 839 Data collected: 1997-2006 Comprehensive catchment area survey SMI method of assessment: ICD-10 diagnosis of depressive disorder (from case notes) Substance misuse method of assessment; timescale: ICD-10 diagnosis of alcohol or drug dependence or misuse (from case notes); Current	Prevalence of dual diagnosis: ICD-10 diagnosis of depressive disorder and ICD-10 diagnosis of alcohol/drug dependence or misuse (from case notes)	Prevalence of dual diagnosis (*combined data for early and late onset depression*): *7.03% (59/839)* alcohol dependence/misuse *1.91% (16/839)* drug dependence/misuse Older patients (60+) who had committed suicide who had early onset depressive illness (EOD, first contact with MH services aged under 60) versus Older patients (60+) who had committed suicide who had late onset depressive illness (LOD, first contact with MH services aged over 60) (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with higher rates for early onset depressive illness group:* Alcohol dependence/misuse (30/290 versus 29/549; *OR 2.07 [1.22, 3.52]; p=0.007*) *Non-statistically significant difference between groups in:* Drug dependence/misuse (5/290 versus 11/549; *OR 0.86 [0.30, 2.49]; p=0.78*)	Identified by authors: (1) Data collection relied on clinical reports and respondents were not blind to outcome (2) Potential misclassification of patients according to age of onset as this study based age of onset on previous contacts with psychiatric services and subsequently did not include prior episodes of depression for which no contact with adult psychiatric services had been sought (3) A third of the population of interest had to be excluded due to insufficient data with respect to their psychiatric history (4) Survey of the clinical circumstances preceding suicide, and unable to make causal inferences (5) A control group of depressed patients who had not died by suicide would have been relevant for identification of suicide risk factors specific for EOD and LOD cases separately. Therefore conclusions are limited to the relative differences between EOD and LOD Identified by review team: (1) Diagnosis of SMI and substance misuse taken from case notes (2) No sub-analyses possible

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Age (years): Range NR (mean: 70.6) Gender (% female): 44 Ethnicity (% white): 96			

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Weaver et al. 2001a Weaver T, Rutter D, Madden P, Ward J, Stimson G, Renton A. Results of a screening survey for co-morbid substance misuse amongst patients in treatment for psychotic disorders: prevalence and service needs in an inner London borough. Social Psychiatry & Psychiatric Epidemiology. 2001;36:399-406. Cohort (++)	Participants were included if they: (1) were current patients in contact local authority and NHS adult CMHTs; (2) had complete data London (Hammersmith & Fulham); Urban N: 1121 Year/s of data collection NR Secondary mental health care; Caseloads of CMHTs SMI method of assessment: Diagnosis of psychosis (from case notes) Substance misuse method of assessment; timescale: Keyworker-reported drug and/or alcohol consumption that met DSM-IV criteria for misuse of drug and/or alcohol; Current Age (years): Range NR (mean: 44.9 [for SMI sample; N=851]) Gender (% female): 44 (for SMI sample; N=851) Ethnicity (% white): 55 (for SMI sample; N=851)	Prevalence of dual diagnosis: Diagnosis of psychosis (from case notes) and diagnosis or staff-reported misuse of substances Characteristics of dual diagnosis: Diagnosis or staff-reported misuse of alcohol; Staff-reported misuse of cannabis/ heroin, methadone, cocaine or crack cocaine/ hallucinogens, stimulants, amphetamines/ prescription drugs); Diagnosis of schizophrenia/ manic depression or bipolar affective disorder or psychotic depression/ non-specific psychosis (from case notes) Gender variation: Number of females Age variation: Number of 16-30/31-40/ 41-50/≥51 year olds Ethnic variation: Number of white participants Prevalence of health care needs: Service utilisation (Number of participants who had antipsychotic medication prescribed [reported by keyworker]); Medication adherence (Non-compliant with antipsychotic medication amongst prescribed subgroup [reported by keyworker]); Met and unmet treatment needs (Number of patients currently receiving substance misuse interventions [reported by keyworker]; Caseworker assessment of number of patients who have a current unmet need for substance misuse interventions) Prevalence of social care needs: Service	Prevalence of dual diagnosis: 24.44% (208/851) Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *62.98% (131*/208) alcohol misuse (*combined alcohol misuse only and alcohol and drug misuse*) *40.87%* (85/208) cannabis misuse *18.75%* (39/208) heroin, methadone, cocaine or crack cocaine misuse *10.58%* (22/208) hallucinogens, stimulants, amphetamines misuse *12.02%* (25/208) prescription drugs misuse Met/Unmet treatment needs: 19.71% (41/208) currently receiving substance misuse interventions 48.08% (100/208) have a current unmet need for substance misuse interventions SMI with substance misuse versus SMI without substance misuse (*compared groups using the Mantel-Haenszel method):* *Statistically significant difference between groups, with lower rates in the dual diagnosis group for:* Number of females (59/208 versus 312/643; *OR 0.42 [0.30, 0.59]; p<0.00001*) Number of 51 year olds and over (28/208 versus 257/643; *OR 0.23 [0.15, 0.36]; p<0.00001*)	Identified by authors: (1) Prevalence estimate for substance misuse based upon assessment of each patient's caseworker(s). Patient assessments were not undertaken, and for this reason data about frequency of misuse, level of consumption and classification of dependent use was not assessed (2) Comorbid patients may be at higher risk of disengagement from services but this study only assessed the prevalence of substance misuse comorbidity amongst psychotic patients in current contact with services (3) Study adopted a cross-sectional design which may underestimate the extent to which comorbid patients received substance misuse treatment. This would occur if treatment were provided on a 'serial' rather than concurrent basis (4) Study based within a single London borough so generalisability of findings needs to be considered Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Reliance on keyworker reports of diagnosis (from case notes) and substance misuse with no objective confirmation

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
		utilisation (Number of participants who had social care services provided [reported by keyworker])	*Statistically significant difference between groups, with higher rates in the dual diagnosis group for:* Number of 16-30 year olds (43/208 versus 83/643; *OR 1.76 [1.17, 2.64]; p=0.007*) Number of 31-40 year olds (73/208 versus 164/643; *OR 1.58 [1.13, 2.21]; p=0.008*) Number of 41-50 year olds (64/208 versus 139/643; *OR 1.61 [1.14, 2.29]; p=0.007*) Number of participants who had social care services provided (122/208 versus 318/643; *OR 1.45 [1.06, 1.99]; p=0.02*) Medication non-compliance (92/185 versus 126/590; *OR 3.64 [2.57, 5.16]; p<0.00001*) *Non-statistically significant differences between groups in:* Diagnosis of schizophrenia (146/208 versus 465/643; *OR 0.90 [0.64, 1.27]; p=0.55*) Diagnosis of manic depression/bipolar affective disorder/psychotic depression (30/208 versus 63/643; *OR 1.55 [0.97, 2.47]; p=0.06*) Diagnosis of non-specific psychosis (32/208 versus 115/643; *OR 0.83 [0.54, 1.28]; p=0.41*) Number of white participants (combined white [excl. Irish] and Irish; *124*/208 versus *348*/643; *OR 1.25 [0.91, 1.72]; p=0.17*) Number of participants who had	(3) No data reported for participants with substance misuse without SMI to allow for comparison (4) Unclear overlapping samples/data with Weaver 2001b and Weaver 2003/2004

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			antipsychotic medication prescribed (185/208 versus 590/643; *OR 0.72 [0.43, 1.21]; p=0.22*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Weaver et al. 2001b Weaver T, Hickman M, Rutter D, Ward J, Stimson G, Renton, A. The prevalence and management of co-morbid substance misuse and mental illness: results of a screening survey in substance misuse and mental health treatment populations. Drug and Alcohol Review. 2001;20:407-416. Cohort (++)	Participants were included if they: (1) were a current patient of substance misuse services or CMHTs within an inner London borough (Hammersmith and Fulham); (2) had completed the assessment process of their respective services London (Hammersmith & Fulham); Urban N: 1298 Year/s of data collection NR Mixed service settings; Caseloads of CMHTs and substance misuse services SMI method of assessment: ICD-10 diagnosis of non-substance-induced psychotic disorders (including schizophrenia, manic depression, bipolar affective disorder) (from case notes) Substance misuse method of assessment; timescale: Keyworker-reported drug and/or alcohol consumption that met DSM-IV criteria for misuse of drug and/or alcohol; Current Age (years): 17-86 (mean NR; median: 38-45) Gender (% female): 42 Ethnicity (% white): 70	Prevalence of dual diagnosis: ICD-10 diagnosis of non-substance-induced psychotic disorders (including schizophrenia, manic depression, bipolar effective disorder) (from case notes); ICD-10 diagnosis (from case notes) or staff-reported current substance misuse problem reported Characteristics of dual diagnosis: Diagnosis or staff-reported misuse of alcohol (-only?); Staff-reported misuse of cannabis/ heroin, methadone, cocaine or crack cocaine/ hallucinogens, stimulants, amphetamines/ prescription drugs Prevalence of health care needs: Met/unmet treatment needs (Number of patients currently receiving substance misuse interventions [reported by keyworker]; Caseworker assessment of number of patients who have a current unmet need for substance misuse interventions)	Prevalence of dual diagnosis: 5.71% (21/368) of caseload of substance misuse services with psychosis 24.41% (227/930) of caseload of CMHTs with substance misuse Characteristics of dual diagnosis CMHT clients (*calculated as a % of dual diagnosis sample*): *66.96%* (152/227) alcohol misuse *42.29%* (96/227) cannabis misuse *18.50%* (42/227) heroin, methadone, cocaine or crack cocaine misuse *11.01%* (25/227) hallucinogens, stimulants, amphetamines misuse *14.10%* (32/227) prescription drugs misuse Met/Unmet treatment needs of CMHT clients (*calculated as a % of dual diagnosis sample*): *24.67%* (56/227) currently receiving substance misuse interventions *51.98%* (118/227) have a current unmet need for substance misuse interventions	Identified by authors: (1) Sensitivity and specificity of keyworker assessments has not been formally assessed (2) Cross-sectional survey may underestimate the provision of treatment to comorbid patients where these are provided successively rather than concurrently (3) Study was based within a single inner London borough and prevalence of both psychiatric morbidity and substance misuse will be higher than in rural UK settings and may differ from other urban areas Identified by review team: (1) Restricted to those in contact with secondary mental health or substance misuse services (2) Reliance on keyworker reports of diagnosis (from case notes) and substance misuse with no objective confirmation (3) Unclear overlapping samples/data with Weaver 2001a and Weaver 2003/2004

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Weaver et al. 2003/2004 [COSMIC study] Weaver T, Madden P, Charles V, Stimson G, Renton A, Tyrer P. Comorbidity of substance misuse and mental illness in community mental health and substance misuse services. British Journal of Psychiatry. 2003;183:304-13. Weaver T, Stimson G, Tyrer P, Barnes T, Renton A. What are the implications for clinical management and service development of prevalent comorbidity in UK mental health and substance misuse treatment populations?. Drugs: Education, Prevention, and Policy. 2004;11:329-48. Cohort (++)	All patients of the drug and alcohol teams who were allocated to the caseload of a keyworker and psychiatrist/Responsible Medical Officer (RMO) on the census date were included in the substance misuse caseload census population. To be included in the CMHT caseload census population, patients had to be allocated to the caseload of a care coordinator and psychiatrist/RMO on the census date, be aged 16-64 years and be included on the local CPA register. Interview samples were selected from these census populations using random case selection procedures London (Brent, and Hammersmith & Fulham), Nottingham and Sheffield; Urban N: 560 Data collected: 2001-2002 Mixed service settings; Caseloads of CMHTs and substance misuse services SMI method of assessment: Participants in substance misuse services assessed for psychosis using the OPCRIT based on a case note review. Service-defined diagnoses were used to identify CMHT patients with psychosis Substance misuse method of	Prevalence of dual diagnosis: ICD-10 diagnosis of SMI (from case notes) and self-reported or staff-reported harmful alcohol use or drug use Characteristics of dual diagnosis: Self-reported harmful drug use (any drug use plus associated problems reported by keyworker and/or patient); Dependent use of illicit or non-prescribed drugs (Severity of Dependence Scale [SDS] score≥7); Self-reported use of cannabis/sedatives or tranquillisers/crack cocaine/cocaine/ heroin/ecstasy/amphetamines/opiate substitutes; Frequency of dependent use of cannabis/sedatives or tranquillisers/cocaine or crack cocaine/heroin or opiates; Harmful alcohol use (AUDIT score≥8); Severe alcohol problems (AUDIT score≥15); Diagnosis of schizophrenia/bipolar affective disorder/non-specific psychosis/severe depression (using OPCRIT based on casenote review) Prevalence of health and social care needs: Camberwell Assessment of Need (CAN) assesses current needs (met and unmet) in 22 domains (including housing, money, physical health and self-care): Number of needs excluding mental health items or excluding drug and alcohol items (range 0-20; self-report; lower better); Severity of need score excluding mental health items or excluding drug and alcohol items (range 0-40; self-report; lower better); Number of met needs excluding mental health items or excluding drug and alcohol items (range 0-20; self-report;	Prevalence of dual diagnosis: *41.43% (232/560)* of CMHT and substance misuse caseloads with dual diagnosis (*CMHT sample not divided by SMI and CMHD but 91% meet our criteria for SMI. Combined CMHT and substance misuse service figures*) 43.97% (124/282) caseload of CMHTs with substance misuse *38.85% (108/278)* caseload of drug and alcohol services with SMI (*combined psychosis and severe depression groups and alcohol and drug service patients*) Characteristics of dual diagnosis for CMHT clients (*calculated as % of dual diagnosis sample*): *67.74%* (84/124) harmful drug use *37.90%* (47/124) dependent use of illicit or non-prescribed drugs *57.26%* (71/124) cannabis use *29.03%* (36/124) dependent use of cannabis *16.94%* (21/124) sedatives/tranquillisers use *4.84%* (6/124) dependent use of sedatives/tranquillisers *12.90%* (16/124) crack cocaine use *9.68%* (12/124) dependent use of cocaine/crack cocaine *8.87%* (11/124) heroin use *4.84%* (6/124) dependent use of heroin/opiates *8.87%* (11/124) ecstasy use *7.26%* (9/124) amphetamines use *6.45%* (8/124) cocaine use *3.23%* (4/124) opiate substitutes	Identified by authors: (1) Comorbidity assessed within current treatment populations, which tend to include more complex cases, therefore, findings are not generalisable to the same diagnostically defined groups within the general population (2) Given sample sizes, some prevalence estimates lack precision (3) Study compares the prevalence of comorbidity in samples drawn from 2 urban centres in London and from Nottingham and Sheffield but need to exercise caution in interpretation of these findings. Nottingham and Sheffield are not necessarily representative of urban areas outside London. Similarly, it is important to note that the London centres were both inner-city ones and not representative of London as a whole. People in inner London with SMI have rates of geographical mobility that are twice as high as those for outer London Identified by review team: (1) Restricted to those in contact with secondary mental health or substance misuse services (2) Unclear overlapping samples/data with Weaver 2001a and Weaver 2001b

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	assessment; timescale: Harmful alcohol-related problems assessed using AUDIT (score≥ 8). A structured interview checklist identified drug types used and whether associated problems were present (economic, domestic, social, legal or interpersonal). Problem drug use defined as self-reported presence of one or more of the above drug-related problems or care coordinator assessment of misuse. The Severity of Dependence Scale (Gossop et al. 1995) assessed drug dependency. To assess the reliability of self-reported drug use in CMHT patients, a random subsample of participants also had hair and urine samples tested using chromatography and mass spectrometry analysis; Current; 1 year Age (years): 18-68 (mean NR; median: 32-43) Gender (% female): 39 Ethnicity (% white): 81	higher better); Number of unmet needs excluding mental health items or excluding drug and alcohol items (range 0-20; self-report; lower better) Prevalence of health care needs: Met/Unmet treatment needs (Number of patients with harmful alcohol use who had received alcohol-related interventions in the month prior to assessment [reported by keyworker]; Number of patients reporting problem drug use who had received drug-related interventions in the month prior to assessment [reported by keyworker]); Service utilisation (Number of drug and alcohol service patients with psychosis consulting any service/GP/drug service psychiatrist/MH service psychiatrist/MH service psychiatrist and allocation to CMHT keyworker or care coordinator specifically about mental health problems [reported by keyworker]; Number of drug and alcohol service patients with psychosis for whom antipsychotic/antidepressant medication prescribed [reported by keyworker]; Number of drug and alcohol service patients with psychosis receiving interventions from specialist MH services: Mental health assessment or monitoring or review/Counselling or psychotherapy/Care management [including day care]/ Day care) Symptom severity (Comprehensive Psychopathological Rating Scale [CPRS]; lower better; rater NR; number of items and min/max score range NR) Prevalence of social care needs: Social	use *58.06%* (72/124) harmful alcohol use *20.97%* (26/124) severe alcohol problems Characteristics of dual diagnosis for substance misuse clients (*combined alcohol and drug service patients and calculated as % of dual diagnosis sample*): *7.41% (8/108)* schizophrenia *3.70% (4/108)* bipolar affective disorder *15.74% (17/108)* non-specific psychosis *73.15% (79/108)* severe depression Met/Unmet treatment needs for CMHT clients (*calculated as % of dual diagnosis sample*): *20.83% (15/72)* patients with harmful alcohol use who had received alcohol-related interventions in the month prior to assessment *16.67% (14/84)* patients reporting problem drug use who had received drug-related interventions in the month prior to assessment Met/Unmet treatment needs for substance misuse service clients (*calculated as % of dual diagnosis sample*): *96.55% (28/29)* consulting any service specifically about mental health problems *13.79% (4/29)* consulting GP	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
		Function Questionnaire (SFQ): Total (lower better; rater NR; number of items and min/max score range NR)	specifically about mental health problems *13.79% (4/29)* consulting drug service psychiatrist specifically about mental health problems *24.14% (7/29)* consulting MH service psychiatrist specifically about mental health problems *44.83% (13/29)* consulting MH service psychiatrist and allocation to CMHT keyworker/care coordinator specifically about mental health problems *68.97% (20/29)* had antipsychotic medication prescribed *68.97% (20/29)* had antidepressant medication prescribed *68.97% (20/29)* receiving mental health assessment/monitoring/review from specialist MH services *31.03% (9/29)* receiving counselling/psychotherapy from specialist MH services *31.03% (9/29)* receiving care management (including day care) from specialist MH services *24.14% (7/29)* receiving day care from specialist MH services CMHT clients with substance misuse versus CMHT clients without substance misuse (compared groups using Mann-Whitney U test): Statistically significant differences between groups, with greater rates in dual diagnosis group for:	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			Poor social function (median 9 [range=0-21; N=119] versus 7 [range=0-21; N=151]; U = 6971.0, p=0.002) Psychiatric symptom severity (median 22 [range=0=75; N=124] versus 15.5 [range=0-65; N=158]; U = 5.8, p=0.001) Number of needs (median 5 [range=0-15; N=124] versus 4 [range=0-12; N=158]; U = 7493.0, p=0.001) Severity of need score (median 7 [range=0-26; N=124] versus 5 [range=0-20; N=158]; U = 7309.0, p<0.001) Number of met needs (median 3 [range=0-13; N=124] versus 2 [range=0-10; N=158]; U=8285.5, p=0.03) Number of unmet needs (median 2 [range=0-9; N=124] versus 1.5 [range=0-9; N=158]; U = 7576.5, p=0.001) London CMHTs versus Nottingham and Sheffield CMHTs (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference, with higher rates in London CMHT group for:* Harmful alcohol use or drug use (61/114 versus 63/168; *OR 1.92 [1.18, 3.11]; p=0.008*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			Problem drug use (48/61 versus 36/63; *OR 2.77 [1.26, 6.10]; p=0.01*) Cannabis use (41/61 versus 30/63; *OR 2.25 [1.09, 4.67]; p=0.03*) Sedatives/tranquillisers use (19/61 versus 2/63; *OR 13.80 [3.05, 62.40]; p=0.0007*) *Non-statistically significant differences between groups in:* Crack cocaine use (11/61 versus 5/63; *OR 2.55 [0.83, 7.84]; p=0.10*) Heroin use (7/61 versus 4/63; *OR 1.91 [0.53, 6.90]; p=0.32*) Ecstasy use (6/61 versus 5/63; *OR 1.27 [0.37, 4.39]; p=0.71*) Amphetamines use (4/61 versus 5/63; *OR 0.81 [0.21, 3.19]; p=0.77*) Cocaine use (6/61 versus 2/63; *OR 3.33 [0.64, 17.17]; p=0.15*) Opiates substitute use (3/61 versus 1/63; *OR 3.21 [0.32, 31.71]; p=0.32*) Drug dependence (28/61 versus 19/63; *OR 1.96 [0.94, 4.11]; p=0.07*) Dependent use of cannabis (22/61 versus 14/63; *OR 1.97 [0.90, 4.36]; p=0.09*) Dependent use of cocaine/crack cocaine (8/61 versus 4/63; *OR 2.23 [0.63, 7.82]; p=0.21*) Dependent use of heroin/opiates (4/61 versus 2/63; *OR 2.14 [0.38, 12.14]; p=0.39*) Dependent use of sedatives/tranquillisers (3/61 versus 3/63; *OR 1.03 [0.20, 5.34]; p=0.97*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			Dependent use of stimulants (2/61 versus 5/63; *OR 0.39 [0.07, 2.11]; p=0.28*) Harmful alcohol use (31/61 versus 41/63; *OR 0.55 [0.27, 1.14]; p=0.11*) London drug services versus Nottingham and Sheffield drug services (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Non-statistically significant differences between groups in:* Diagnosis of non-substance-induced psychotic disorder or severe depression (*combined psychosis and severe depression groups; 32*/85 versus *43*/131; *OR 1.24 [0.70, 2.19]; p=0.47*) Diagnosis of schizophrenia (3/32 versus 3/43; *OR 1.38 [0.26, 7.33]; p=0.71*) Diagnosis of bipolar affective disorder or psychotic depression (1/32 versus 0/43; *OR 4.14 [0.16, 105.07]; p=0.39*) Diagnosis of non-specific psychosis (5/32 versus 5/43; *OR 1.41 [0.37, 5.34]; p=0.62*) Diagnosis of severe depression (23/32 versus 35/43; *OR 0.58 [0.20, 1.73]; p=0.33*) Drug and alcohol service patients with comorbid psychotic disorder	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			versus drug and alcohol service patients with no comorbid psychiatric disorder (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant difference between groups, with higher rates in dual diagnosis group:* Number of needs (mean 7.3 [sd=3.5] versus 2.2 [sd=1.4]; *MD 5.10 [3.78, 6.42]; p<0.000001*) Severity of need (mean 10.7 [sd=6] versus 2.9 [sd=2.2]; *MD 7.80 [5.55, 10.05]; p<0.00001*) Number of met needs (mean 4.2 [sd=3] versus 1.5 [sd=1.2]; *MD 2.70 [1.57, 3.83]; p<0.00001*) Number of unmet needs (mean 3.7 [sd=2.3] versus 1 [sd=1.2]; *MD 2.70 [1.81, 3.59]; p<0.00001*)	

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Wiles et al. 2006 [APMS, 2001] Wiles NJ, Zammit S, Bebbington P, Singleton N, Meltzer H, Lewis G. Self-reported psychotic symptoms in the general population: results from the longitudinal study of the British National Psychiatric Morbidity Survey. British Journal of Psychiatry. 2006;188:519-26. Cohort (+)	Secondary analysis of data from the survey of Psychiatric Morbidity among Adults [16-74 years] Living in Private Households in England, Wales, and Scotland (Singleton et al., 2001) England, Scotland and Wales; Mixed N: 1795 Data collected: 2000 Comprehensive catchment area survey SMI method of assessment: Self-reported psychotic symptoms (within 18 month follow-up measured using Psychosis Screening Questionnaire [PSQ; Bebbington & Nayani, 1995]) Substance misuse method of assessment; timescale: Harmful drinking (AUDIT score ≥16) and dependency on cannabis (based on positive response to 1/5 questions: daily use for ≥2 weeks; self-reported dependence; inability to cut down; need to use larger quantities to get an effect; symptoms of withdrawal); 18 months Age (years): NR Gender (% female): NR Ethnicity (% white): NR	Relationship between SMI and substance misuse: Univariable predictors of incident self-reported psychotic symptoms (within 18 month follow-up measured using Psychosis Screening Questionnaire [PSQ; Bebbington & Nayani, 1995]): Harmful drinking (AUDIT score ≥16)/ Dependency on cannabis (based on positive response to 1/5 questions: daily use for ≥2 weeks; self-reported dependence; inability to cut down; need to use larger quantities to get an effect; symptoms of withdrawal)	Relationship between SMI and substance misuse: Harmful drinking as predictor of psychotic symptoms (OR 3.31 [1.52, 7.22]) Cannabis dependency as predictor or psychotic symptoms (OR 3.40 [1.50, 7.73])	Identified by authors: (1) Psychotic symptoms were based on self-report rather than clinical interview (2) Given the low incidence of psychotic symptoms, the study may have been underpowered to detect associations with rare exposures (3) Unable to examine risk factors for persistent psychotic symptoms, owing to their low incidence Identified by review team: (1) Reliance on self-report ratings for SMI diagnosis and substance use with no objective confirmation

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
Wright et al. 2000/2002 Wright S, Gournay K, Glorney E, Thornicroft G. Dual diagnosis in the suburbs: prevalence, need and in-patient service use. Social Psychiatry and Psychiatric Epidemiology. 2000:35;297-304 Wright S, Gournay K, Glorney E, Thornicroft G. Mental illness, substance abuse, demographics and offending: dual diagnosis in the suburbs. The Journal of Forensic Psychiatry. 2002;13:35-52. Case-control (++)	Medical case records of patients of Croydon Health Authority's mental health service in Central West Sector were screened. Participants were included if they: (1) were aged 18-65 years old; (2) had a clinical diagnosis of any form of functional psychosis (other than drug-induced psychosis); (3) in recorded contact with the catchment area mental health team in the previous 6 months. Participants were excluded if they: (1) had been discharged or transferred to another sector team prior to the data collection phase of the study; (2) were not in present contact with the sector team. Eligible patient records were randomly ordered and patients approached until the estimated necessary sample size of 40 was achieved Croydon; Suburban N: 40 Year/s of data collection NR Secondary mental health care; Random sample of caseload of Croydon Health Authority's mental health service in Central West Sector SMI method of assessment: Clinical diagnosis of any form of functional psychosis other than drug-induced psychosis (from case notes)	Prevalence of dual diagnosis: Diagnosis of functional psychosis other than drug-induced psychosis (from case notes) and self-reported (South Westminster Substance Misuse Questionnaire [Duke et al., 1994] and/or staff-rated substance misuse Characteristics of dual diagnosis: Alcohol misuse; Drug misuse Gender variation: Number of females Ethnic variation: Number of white participants Prevalence of social care needs: Housing (Health of the Nation Outcome Scale (HoNOS; Wing et al., 1998): Number of participants rated as having one or more significant problems with their housing (HoNOS score≥2); Contact with criminal justice system (Criminal Profile Schedule [CPS; Gunn & Robertson, 1976]: Lifetime history of offending behaviour/ non-substance misuse related offending; Lifetime history of offending behaviour [case records]); Violence (CPS: Lifetime history of non-substance misuse related violence; Any recorded violence in 6 months prior to interview [case records]; Brief Psychiatric Rating Scale [BPRS; Overall & Gorman, 1962]: Hostility [threatening and aggressive behaviour over the 2 weeks prior to interview; score≥2]; Self-report of having threatened anyone, been in a fight, hit anyone, or set fire to anything in the 6 months prior to interview; HoNOS: Aggressive, disruptive	Prevalence of dual diagnosis: 32.5% (13/40) Characteristics of dual diagnosis (*calculated as % of dual diagnosis sample*): *84.62% (11/13)* alcohol misuse *38.46% (5/13)* drug misuse SMI patients with comorbid substance misuse versus SMI-only patients (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant differences between groups, with higher rates in dual diagnosis*: Housing problems (7/13 versus 2/27; *OR 14.58 [2.40, 88.80]; p=0.004*) Lifetime history of non-substance misuse related offending (10/13 versus 6/27; *OR 11.67 [2.41, 56.49]; p=0.002*) Lifetime history of non-substance misuse related violence (7/13 versus 3/27; *OR 9.33 [1.84, 47.24]; p=0.007*) Lifetime history of offending behaviour from case records (6/13 versus 2/27; *OR 10.71 [1.76, 65.24]; p=0.01*) *Non-statistically significant differences between groups in:* Number of females (*authors*	Identified by authors: (1) Possible selection biases as the study attempted to contact patients with SMI who had been in contact with the sector services at least once in the preceding 6-month period but patients who had been in less frequent contact may have lower levels of substance use (2) Relatively large proportion of patients who were resident in 24-h staffed hostels (10 [25%] of total sample were hostel residents, 3 of whom [8%] were DD cases) may have lowered the observed prevalence of DD, given that a low prevalence rate for addictive disorders have been found in nursing home residents (Regier et al., 1990) (3) The South Westminster Substance Misuse Questionnaire cannot be regarded as a fully standardised test. Its reliability and validity are not supported by substantial data, and it has not been validated against established criteria for substance misuse disorders (5) Small sample size and low response rate (66%) Identified by review team: (1) Restricted to those in contact with secondary mental health services (2) Diagnosis of SMI taken from case notes

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
	Substance misuse method of assessment; timescale: Self-reported (South Westminster Substance Misuse Questionnaire [Duke et al., 1994] and/or staff-rated substance misuse; Current Age (years): Range NR (mean: 41.4) Gender (% female): 45 Ethnicity (% white): 48	or violent behaviour over the month prior to interview [score≥2 [mildly aggressive, disruptive, or violent behaviour]])	*reported number of males and review team converted to number of females*; *4*/13 versus *14*/27; *OR 0.41 [0.10, 1.67]; p=0.21*) Number of white participants (*authors reported number of non-white participants and review team converted to number of white participants*; *6*/13 versus *13*/27; *OR 0.92 [0.25, 3.48]; p=0.91*) Any recorded violence in previous 6 months (4/13 versus 2/27; *OR 5.56 [0.86, 35.71]; p=0.07*) Hostility (2/13 versus 6/27; *OR 0.64 [0.11, 3.69]; p=0.61*) Self-report of having threatened anyone, been in a fight, hit anyone, or set fire to anything in previous 6 months (2/13 versus 1/27; *OR 4.73 [0.39, 57.70]; p=0.22*) Aggressive or violent behaviour in previous month (2/13 versus 2/27; *OR 2.27 [0.28, 18.27]; p=0.44*) SMI patients with lifetime history of drug misuse versus SMI patients with no lifetime history of drug misuse (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Statistically significant differences between groups, with higher rates in dual diagnosis*: Lifetime history of offending behaviour (*calculated event rates from % and authors reported 'no*	(3) Substance misuse based on self-report or staff ratings with no objective confirmation (4) Data cannot be extracted for all outcomes as either not reported or continuous data reported without a measure of variability (e.g. standard deviation) (5) Small sample size

Study; Bibliographic reference; Study design; Quality rating	Study characteristics (including inclusion/exclusion criteria; geographic region and location; N; years of data collection; sampling frame; SMI and SM diagnostic criteria status; demographics)	Outcomes	Results *Results in italics indicate calculations or analysis conducted by the review team* Confidence intervals in square brackets are 95% confidence intervals	Limitations
			offending reported' which review team converted to any offending; *12*/14 versus *7*/26; *OR 16.29 [2.89, 91.83]; p=0.002*) SMI patients with lifetime history of alcohol misuse versus SMI patients with no lifetime history of alcohol misuse (*compared groups using the Mantel-Haenszel method for dichotomous outcomes or the inverse variance method for continuous outcomes)*: *Non-statistically significant differences between groups in:* Lifetime history of offending behaviour (*calculated event rates from % and authors reported 'no offending reported' which review team converted to any offending*; *18*/37 versus *1*/3; *OR 1.89 [0.16, 22.75]; p=0.61*)	

APPENDIX 12. EVIDENCE TABLES: RQ1.2 CURRENT PRACTICE

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Bailey 2002 Bailey D. Training together: an exploration of a shared learning approach to dual diagnosis training for specialist drugs workers and Approved Social Workers (ASWs). Social Work Education. 2002;21:565-81. Local report (+) Aims to describes the social and professional contexts that shape training agendas	**Illicit Drugs and Mental Health Training Course**	Mental illness and drug/alcohol misuse	Birmingham University	No	No	Yes	Four day training course in the Department of Social Policy and Social Work at Birmingham University for mental health workers and drug workers. Initially designed and piloted in response to a training need identified by Birmingham Social Services Department and Birmingham Drugs Action Team. Key good practice point: training course developed in response to a training need.	n/a	n/a	n/a	No	Provides a good description of the background of the training course, limited information about the course itself.

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Bayney et al 2002 Bayney R, St John-Smith P, Conhye A. MIDAS: a new service for the mentally ill with comorbid drug and alcohol misuse. Psychiatric Bulletin. 2002;26:251-54. Cross-sectional study (+) Aims to describe the work and patient characteristics of MIDAS	**The Mental Illness and Drug and Alcohol Service (MIDAS)**	Adult; acute or chronic mental illness and drug/alcohol misuse	Hertfordshire; mixed	Yes, assessment, monitoring, assertive outreach and individualised case management	No	No	The service provides a comprehensive initial assessment within 1 week of accepting a referral, monitoring of mental illness and drug and alcohol use via an assertive outreach approach, individualised case management via a multi-disciplinary approach. Acceptance rate to service from referrals was 98%. 55% of patients disengaged from service at 18 months, for 38% this was due to non-engagement with treatment. Key good practice points: (a) provide rapid availability of interventions and rapid response to referrals, (b) actively collaborate with other hospital and community professionals, (c) provide a model of treatment informed from a multi-disciplinary perspective, (d) establish good communication within the team about both mental health and substance misuse aspects of each patient, (e) ease of access to the team both in terms of its position in town	3x community psychiatric nurses 2x drug and alcohol workers 2x care support workers 1x administrative worker (includes a 24 hour crisis intervention team)	Separate	Weekdays 9am-5pm and 24-hour crisis intervention team	Unclear (contact details unavailable)	Study sample may be unrepresentative of dual diagnosis population; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
							centre and the high acceptance rate					

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Bell 2014 Bell R. A multi-agency evaluation of the Leeds dual diagnosis care co-ordination protocol. Advances in Dual Diagnosis. 2014;7:162-84. Cross-sectional (++) Aims to evaluate the Leeds Dual Diagnosis care co-ordination protocol, looking at the prevalence of people with dual diagnosis accessing services and identifying the standard of care provided	**Leeds Dual Diagnosis Project**	Adults; mental illness and drug/alcohol misuse	Leeds	No	Yes, the DD network ensures that services that come into contact with people with a dual diagnosis are readily able to assess, engage and co-ordinate care effectively	Yes, the DD strategy group provides consultation and support in the implementation of the DD Project action plan. It contributes towards the development of local care pathways, guidelines and protocols, supporting their implementation within the organisations members	The Dual Diagnosis (DD) Project facilitates a variety of working groups and forums to achieve its aim, including 3 core groups, the DD Strategy Group, DD Working Group and DD Network. The DD Strategy Group comprises of senior commissioners from NHS Leeds and Leeds City Council, strategic managers from mental health and substance use sectors. The DD Network is a multi-agency network of lead DD practitioners from services across Leeds that has a shared vision of collaborative and integrated treatment. This includes representation from mental health, drug, alcohol, criminal justice and housing/homeless services. The DD Working Group is attended by operational/senior managers and senior practitioners from organisations engaged with the Leeds DD Network, essentially it acts	Commissioners, strategic managers from mental health and substance use sectors, DD Expert Reference Group, lead DD practitioners	n/a	n/a	Yes	Limitations to the data on prevalence and standards of care, but good description of the service; commissioned by the NHS, managed by a third sector organisation.

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
							as a link between the DD Strategy Group and DD Network. Key good practice points: (a) good working relationships and trust between services to ensure effective joint working, (b) inclusion of consultants with lived experience of dual diagnosis.					

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Dugmore 2010 Dugmore L. Partnership working in dual diagnosis. Nursing Times. 2011;107:20-21. Local report (+) Aims to describe the background and role of Baseline	**Baseline**	Adult; any mental illness and stimulant misuse	Leicestershire; unclear	Yes; provision of assessments	Yes; advice provided to clients and staff, service users were signposted to appropriate mental health services if necessary	Yes	A voluntary organisation drop-in service for drug and alcohol misuse which recruited a mental health practitioner and a nurse consultant to cater for service user's additional mental health needs. In a six month time frame, 47 service users were seen. Accessibility and acceptability not reported. Key good practice points: (a) develop an ethos of harm minimisations and drug reduction, (b) have terms of reference for the practitioner role, (c) ensure staff can share practice to learn from each other, (d) enable clients to see all relevant professionals in one appointment, (e) undertake shared risk and needs assessments	1x dual diagnosis nurse consultant (1 morning/week) A team of drug and alcohol healthcare professionals	Integrated	Not reported	No	Appraisal of service may be biased, report written by the acting nurse consultant; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Gorry & Dodd, 2008 Gorry A, Dodd T. Overview of the NIMHE/CSIP National Dual Diagnosis Programme in England. Advances in Dual Diagnosis. 2008;1:9-13. National report (+) Aims to review the work of the national dual diagnosis programme	**NIMHE Dual Diagnosis Programme**	Adult; mental illness and drug/alcohol misuse	8 regional development centres; mixed	No	Yes	Yes	The main aim of the programme is to drive and implement national guidance and recommendations to improve the service user's and carer's journey into and out of services. This is achieved in a number of ways, in particular by working closely with developments in health and social policy, informing often divergent policy outcomes, and managing the resultant tensions in service delivery and development. The programme supports providers and commissioners by developing products that bring together best practice and innovation to address some of the gaps in service provision.	n/a	Integrated ?	n/a	Unclear (contact details unavailable)	

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a dual diagnosis	**Nottingham University Dual Diagnosis Module**	n/a	Nottingham	No	No	Yes	Higher education learning module developed as collaboration between the university and Nottinghamshire Healthcare NHS Trust. Includes service user-led sessions and opportunities for students to explore their work experiences with a service user and carer panel. Key good practice points: (a) engaging service users and carers in developing and delivering training engenders a collaborative approach to working, (b) building a practice learning time aids application of theory to practice.	n/a	n/a	n/a	No	Descriptions of training programmes very brief; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a dual diagnosis	**Manchester Collaborative**	n/a	Manchester	No	No	Yes	A collaborative initiative developed by the Manchester Drug and Alcohol Strategy Group which represents the DAAT, Manchester Mental Health and Social Care NHS Trust, Manchester City Council and other health and social care providers. Includes skills training delivered collaboratively by a range of services for any practitioner across the health and social care spectrum. Key good practice points: (a) shared commissioning of the training has prevented funding acting as a barrier to practitioners' development, (b) networking has improved practitioners' ability to signpost to other relevant service providers to meet service users' and carers' needs.	n/a	n/a	n/a	Unclear (no response)	Descriptions of training programmes very brief; funded by the Manchester Drug and Alcohol Strategy Group
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual	**East midlands Regional Dual Diagnosis Network**	n/a	East Midlands	No	No	Yes	Bi-monthly forum for service providers, service users, and carers where learning opportunities and new developments are developed and discussed collaboratively through regular brief presentations	n/a	n/a	n/a	Unclear (no response)	Descriptions of training programmes very brief; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a dual diagnosis							and discussions. Key good practice points: (a) engenders sharing of good practice in a non-hierarchical environment, (b) encourages networking, peer supervision, and exploration of learning across social care and health care, (c) actively encourages the participation of service users and carers, emphasizing a collaborative developmental process.					
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a	**West Midlands Dual Diagnosis Network**	n/a	West Midlands	No	No	Yes	Quarterly forum open to service users, carers, professionals, commissioners and people with an interest in dual diagnosis. It acts as a central point for updating participants on areas of dual-diagnosis development, evidence-based practice and policy. Key good practice points: (a) engenders sharing of good practice in a non-hierarchical environment, (b) encourages networking, peer supervision, and exploration of learning across social care and	n/a	n/a	n/a	Unclear (no response)	Descriptions of training programmes very brief; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
dual diagnosis							health care, (c) actively encourages the participation of service users and carers, emphasizing a collaborative developmental process.					
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a dual diagnosis	**Croydon Managers Dual Diagnosis Forum**	n/a	Croydon, London	No	No	Yes	Aims to improve standards of care provision within agencies, enhance effective working between agencies, and promote collaborative problem-solving to the challenges encountered when multiple agencies are working with a service user with complex needs. The first part of the forum focuses on updating or educating participants on national and local dual diagnosis developments. The second part focuses on case discussion with an emphasis on considering cases that have presented difficulties to service because two or more are involved. Key good practice points: (a) engenders sharing of good practice in a non-hierarchical environment, (b) encourages networking, peer supervision, and exploration of learning across social care and	n/a	n/a	n/a	Unclear (no response)	Descriptions of training programmes very brief; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
							health care					
Manley et al 2008 Manley D, Gorry A, Dodd T. Dual diagnosis - developing capable practitioners to improve services. Advances in Dual Diagnosis. 2008;1:20-26. Local report (+) Aims to explore opportunities to meet the training and support needs of the workforce in delivering high quality care to service users with a dual diagnosis	**The Experiences Nurse Rotation Scheme,**	n/a	Central and North West London and West London Mental Health NHS Trust	No	No	Yes	The scheme offers experienced nurses opportunities for career development and supports their motivation to work within health services, provide health care to communities and to develop and improve the health services that are provided. Key good practice points: (a) encourages skill-sharing across service boundaries, (b) helps staff understand pressures on service, (c) creative pathways for personal and professional development.	n/a	n/a	n/a	Yes	Descriptions of training programmes very brief; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Mental Health Network 2009 Mental Health Network. Seeing double: meeting the challenge of dual diagnosis. NHS Confederation Briefing. 2009;189:1-6. National report (-) Aims to describe key issues around dual diagnosis, explain existing policy and make recommendations	**Combined Psychosis and Substance Use Programme (COMPASS)**		Birmingham and Solihull	Yes, supports people with a dual diagnosis problem	Yes, offers a consultation liaison service to people who are being supported by staff in either adults services or substance misuse services	Yes, a specialist multi-disciplinary team trains and supports existing mental health and substance misuse services to provide integrated treatment	The aim of the programme is to help people access the services they need using an integrated, shared care approach. Most of the people referred to the team are seen in their own home or local mental health centre. Accessibility, acceptability and service utilisation not reported.	Staff are a specialised team within existing mental health or substance misuse services	Integrated (supports existing services to provide integrated treatment)	Not reported	Yes	Limited information about the service; funding received from the three PCTs covering North Birmingham. Plans to expand the COMPASS In 2007 the annual budget was £233,000 per annum

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**The Young People's Drug and Alcohol Service**	Adolescents; drug or alcohol misuse	Newcastle upon Tyne and North Tyneside ; mixed	Yes; assessment, education for families, management of mental health problems and support through transitions	No	No	The service is designed to accept young people with problems related to substance misuse. The service has been hosted by the adult's addiction service which offers support and is now managed through child and adolescent mental health services (CAHMS) within a mental health trust. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) good transition to adult services, (b) excellent links with external agencies, (c) young people are seen in a range of settings, (d) families are actively engaged and educated about substance misuse.	2x nurses 1x consultant addiction psychiatrist (0.5 days/week) , 1x consultant child and adolescent psychiatrist (0.5 days/week)	Integrated (drug and alcohol service within a mental health service)	Not reported	Yes	Limited information about the service; funding not reported
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008	**Lambeth's "virtual integrated team"**	Adolescents; drug or alcohol misuse	Lambeth, London; urban	Yes, assessment, work with families, treatment	No	Yes, training and consultation provided to other staff members in the network and outside	Staff members of the substance misuse team operate from the respective bases of their own agencies. However, most of the clinical activities are based on a model of assertive outreach and the clients are seen in a number of different settings including clients' homes, schools,	1x consultant psychiatrist (0.4 WTE) 1x clinical manager 1x clinical nurse specialist 1x occupational therapist	Integrated	Not reported	Unclear (contact details unavailable)	Limited information about the service; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
National report (+) Aims to describe a range of child and adolescent drug and alcohol services							youth clubs, GP surgeries and mental health clinics. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) an assertive outreach model of service delivery should be followed to maximise rates of engagement, (b) interventions should be evidence based, with clear outcomes and easy to evaluate, (c) a clear framework should be established to do comprehensive, multi-agency assessment of the unique needs of all young people.	1x psychotherapist 1x counselling psychologist				
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+)	**The Lock young people's substance misuse service**	Adolescents; drug or alcohol misuse	Stoke-on-Trent; mixed	Yes, provide assessment, treatment and support to families	Yes, co-ordination with physical health services (GP, dentist, community paediatrician, physician and surgeon) and with mental health services if psychiatric co-morbidity	No	The Lock is a multi-agency service which provides a Tier 3 and 4 day facility, working as a partnership between North Staffordshire Combined Healthcare NHS Trust and Turning Point, with supported accommodation from a local provider to provide a holistic model of care. Accessibility, acceptability and service utilisation not reported. Key good practice points:	1x consultant addiction psychiatrist. (0.5 WTE) 1x project manager 1x personal assistant Several drugs workers 4x supported housing workers	Separate	Day facility, provides outreach, in-reach and home visits	Yes	Limited information about the service; funding not reported

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Aims to describe a range of child and adolescent drug and alcohol services					cannot be treated within the service		(a) a holistic approach, (b) good internal multidisciplinary team working and good inter-agency working practice, (c) outreach, in-reach and home visits to ensure engagement with service, (d) family involvement where possible	At any one time there is usually a senior psychiatric or medical trainee or specialist registrar				
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**Mental health and young people's services**	Adolescents; drug or alcohol misuse	Bradford; urban	Yes, assessment and generation of care and intervention plans for young people and their families	Yes, cross-referral to social services and child protection agencies	No	This is a multi-agency service which includes staff from CAHMS, a local voluntary sector street agency (The Bridge Project) and the Bradford drug action team. It has established collaborative outreach, engagement, self-referral to a child-centred specific project. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) multi-agency service with established collaborative outreach, (b) good links with external agencies, (c) multi-disciplinary team.	1x consultant psychiatrist (4 sessions/week), 1x clinical nurse specialist (5 sessions/week), 1x CAMHS therapist 3x young people's substance misuse workers 1x manager 2x whole time outreach workers 3x education workers 2x arrest referral workers	Integration of services	Not reported	Yes	Limited information about the service; funding not reported

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National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**The CAHMS Specialist Substance Misuse Service (CSSS)**	Adolescent; drug or alcohol misuse	Hackney, Tower Hamlets and Newham; urban	Yes, offers assessments, care plans, treatment and joint working with other agencies	Yes, joint working and referrals made to health and mental health services	Yes, supervision, consultancy, teaching and training.	CSSS is a drug and alcohol service which has established good links with CAMHS, youth offending teams, social services departments, schools, universal and targeted young people's substance misuse agencies and voluntary sector projects. It has strong links with the GP shared care networks. In addition to direct client work, CSSS currently operate in conjunction with Lifeline in Tower Hamlets, Sub 19 in Hackney and Create (In-volve) in Newham. CSSS received approximately 150 referrals in 2005/6. Acceptability and service utilisation not reported. Key good practice points: (a) good links with other services, (b) a flexible, assertive approach to engagement and working with young people, (c) comprehensive assessment including risk assessment, (d) flexible and carefully arranged transitions to adult services.	1x senior nurse/service manager 1x consultant psychiatrist (3 sessions/week) 3x clinical nurse specialists 1x substance misuse practitioner	Integrated	Not reported	Yes, now called Lifeline	Limited information about the service; funding not reported
National Treatment Agency for Drug Misuse 2007	**Adolescent Drug and Alcohol**	Adolescents; drug and alcohol	Hertfordshire; mixed	Yes, provides assessment and	Yes, provides co-ordination with	Yes, provides regular advice,	This is a specialist Tier 3 service which provides treatment interventions with the local Youth	4x quadrant drug workers	Integrated	Not reported	Yes	Limited information about the service;

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National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**Service**	misuse		targeted interventions for young people and their families	CAHMS, Connexions, health services and other child services	support and consultancy to other professionals in the county	Offending Team (YOT) and provides regular formal advice, support and consultancy to the dedicated service workers as well as treatment to a small number of YOT clients. The service comes under the administrative and managerial umbrella of the local child and adolescent mental health services (CAMHS) and as such has excellent co-ordination with the four quadrant CAMHS services. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) the engagement process is facilitated by outreach service to young people's own homes, one-stop shops, children services, schools, GP surgeries and public places such as café's, (b) interventions are based on a holistic, empathetic individually tailored package of care, (c) good links with other services and external agencies.					commissioned by the joint commissioning group and located in the youth justice service with line management provided by the local YOT assistant manager
National Treatment Agency for Drug Misuse 2007	**The Young People's Drug Treatment**	Adolescents; drug and alcohol misuse	Bath and North East Somerset, North Somerset,	Yes, assessment and treatment for young	No	Yes, provides liaison, consultation, supervision	This service is a standalone unit for young people's drug treatment, situated within CAHMS. The service delivers a	1x consultant psychiatrist 1x consultant	Integrated	Not reported	Yes	Limited information about the service; funding not

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National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**Service**		Bristol and South Gloucestershire; mixed	people and their families		and training to other staff members in the network	mixture of office-based sessions and outreach sessions. Young people can be seen in their places of education, GP surgeries, and local agencies offices as well as at home, once a risk assessment has taken place. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) young people can be seen in their places of education, at home, GP surgeries and local agencies offices, (b) provide liaison , consultation and training to other staff members in network, (c) provide assertive outreach to young people with complex presentations, (d) use a care plan approach framework.	psychologist 1x service manager 1.75x clinical nurse specialists 2x specialist drugs workers 1x social worker 1x administrator				reported
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance	**Wiltshire Young People's Substance Misuse Service**	Adolescents; drug and alcohol misuse	Wiltshire; rural	Yes, provides assessment, and a treatment plan	Yes, co-ordinates with other local mental health teams	No	Specialist CAMHS service under the CAMHS management structure. There is no inpatient or day patient hospital base to provide detoxification. Accessibility, acceptability and service utilisation not reported.	1x office administrator (part-time) 1.5x additional drugs workers	Integrated	Monday to Friday 9am - 5pm	No, only accepts people with substance misuse. Referrals for mental health	Limited information about the service; funding not reported

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misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services							Key good practice points: model of engagement is community-based outreach, the workers will meet young clients anywhere suitable in the community and are able to transport young people to appointments.				problem s are made to CAHMS	
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**Birmingh am's Young People's Substanc e Misuse Service**	Adolescents; drug and alcohol misuse	Birmingham; urban	Yes, provide assessme nt and treatment	Yes, co-ordinates with Tier 3 and Tier 4 CAHMS, youth offending teams and the adult addiction psychiatrists	Yes, runs a two-day training programme in substance misuse for CAHMS staff covering basic drug awareness and treatment of psychiatric co-morbidity in substance misusers	The Birmingham service is a partnership between the young person's substance misuse service, Birmingham Holistic Innovative Approaches to Health (HIAH), and Birmingham Children's Hospital CAHMS. The CAMHS substance misuse team works across both of these services and provides specialist substance misuse input into CAMHS; both psychiatric and specialist substance misuse input into HIAH. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) good networks maintained with mental health service, substance misuse services and youth offending teams, (b) delivers a range of interventions, (c)	1x child and adolescent psychiatrist, 2x clinical nurse specialists 1x medical secretary	Integrated	Not reported	Yes	Limited information about the service; funding not reported

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							comprises a team who are specialised in mental health and substance misuse.					
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**Young Person's Substance Misuse Services**	Adolescents; drug and alcohol misuse	Waltham Forest, London; urban	Yes, assessment, treatment and care management	Yes, links with other young person services, including counselling and education services, social services and youth offending	No	A service for young people with more complex needs which provides integrated care to those whose substance misuse requires more structured treatment interventions and care management. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) comprehensive assessment and treatment policies in place, (b) services well publicised, (c) good links with external agencies.	1x manager 1x receptionist, 3x drugs workers 1x adult addictions consultant (2 sessions/week)	Integrated drug and alcohol service within a mental health service	Not reported	Unclear (no response)	Limited information about the service; commissioned by the local Drug and Alcohol Action Team partnership
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008	**Young People's Substance Misuse Services**	Adolescents; drug and alcohol misuse	County Durham; mixed	Yes, provides support to Tier 3 services	No	No	The development of the team began in April 2004 and provides Tier 3 services with Tier 2 support. It is the lead agency for social care and health and aims to be eventually integrated under County Durham children's services. Accessibility, acceptability and service utilisation not reported. Key good practice points unclear	1x associate specialist (3 sessions/week) 1x band 7 nurse as deputy team manager 2x band 6 nurses	Drug and alcohol service integrated within child and adolescent services	Not reported	Unclear (contact details unavailable)	Limited information about the service; funding not reported

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National report (+) Aims to describe a range of child and adolescent drug and alcohol services							due to lack of service information.					
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**The Head2Head team**	Adolescents; any mental illness and drug/alcohol misuse	Nottinghamshire; mixed	Yes, provides assertive assessment and follow-up	No	Yes, regular consultation and training to professionals in partner agencies (e.g. Tier 2 drug services and youth offending teams)	The Head2Head team is a Tier 3 service which provides a service to those young people (18 years and under) requiring specific interventions such as opiate detoxification and cases presenting with both substance use and significant mental health difficulties in the city of Nottingham. The team offers a county-wide service for dual diagnosis. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) ensures low stigma settings, (b) provides out-of-hours-support, (c) caters for adolescents who are pregnant, (d) retains contact with patients serving custodial sentences and reviews them promptly following release to identify and address any relapse into substance use and associated mental health	1x service team leader 1x consultant child and adolescent psychiatrist (0.5 WTE) 1x administrator (0.4 WTE) 1x dual diagnosis nurse 2x dual diagnosis nurses (part-time) 1x administrator, 2x treatment nurses (0.6 WTE)	Separate	Day service (not specified), provides out-of-hours support for patients presenting in crisis	Yes	Limited information about the service; funding not reported

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							problems.					
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services	**IMPACT**	Adolescent; drug and alcohol misuse	Norfolk; mixed	Yes, provides assessment, treatment and rehabilitation for drug/alcohol misuse	Yes, co-ordination with other services (not specified)	Yes, provide support to other agencies	IMPACT is a countywide multi-agency and multidisciplinary specialist treatment service specifically for young people who need help and support with their drug, alcohol or related problems. Specialist young people's workers provide a flexible and responsive service to ensure that young people's treatment needs are met. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) provide a single point of access for drug/alcohol misuse and associated issues, (b) work closely with other agencies, (c) flexible about where to meet young people, (d) provides a multi-agency and multidisciplinary specialist team.	A team of specialist nurses, social workers, youth workers and other professionals and is supported by specialist doctors.	Separate service for drug and alcohol misuse. Unclear whether mental health problems are addressed within the service.	Not reported	Unclear (contact details unavailable)	Limited information about the service; funding not reported
National Treatment Agency for Drug Misuse 2007 National Treatment Agency for Substance Misuse. The role of CAMHS and addiction	**SUBS – Wolverhampton's young people's drug and alcohol team**	Adolescent; drug and alcohol misuse	Wolverhampton; mixed	Yes, offers assessments and interventions	No	No	The service aims to deliver the provision of services in line with the current NTA definition of a young person's service which is as follows: "Young people's specialist substance misuse	1x team manager 1x service administrator 1x youth engagement and support	Separate service for drug and alcohol misuse. Unclear whether mental	Not reported	Unclear (contact details unavailable)	Limited information about the service; funding not reported

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psychiatry in adolescent substance misuse services. NHS; 2008 National report (+) Aims to describe a range of child and adolescent drug and alcohol services							treatment is a care planned medical, psychosocial or harm reduction intervention aimed at alleviating current harm caused by a young person's substance misuse. Service users offered an initial screening within five working days, and an appropriate intervention within ten working days from this initial screening. Acceptability and service utilisation not reported. Key good practice points: (a) multidisciplinary team, (b) range of interventions	worker 2x young people's substance treatment workers 1x paediatric nurse 1x YOT substance worker, 1x resettlement aftercare provision (RAP)co-ordinator 1x RAP support worker	health problems are addressed within the service.			

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Sims et al., 2003 Sims J, Iphofen R, Payne K. The triangular treatment paradigm in dual-diagnosis clients with a mental illness. Journal of Substance Use. 2003;8:112–18. Regional report (+) Aims to outline the role of the service and describe the integrated pathway of care	**Specialist Dual Diagnosis Service**	Adult; any mental illness and drug/alcohol misuse	North west Wales; rural	Yes; including an open referral system, discussion of cases, assessment and initiation of treatment	Yes; co-ordination with existing mental health and substance misuse services	Yes; identification of staff training needs	The service aims to augment, complement and enhance the existing mental health and substance misuse service provision. The service operates an open referral system. Early discussion of the complexity of each case is encouraged between the referrer and the dual-diagnosis worker. Assessment will result in initiation of the treatment stage of the service delivery. Initial assessment would indicate the level of clinical need required and the type of intervention and service the client requires. Accessibility, acceptability and service utilisation not reported. Key good practice point: to be flexible and sensitive to the needs of service users	1x specialist dual diagnosis community psychiatric nurse (provides a consultancy role to other agencies involved in case management)	Integrated	Not reported	Yes	Provides a clear pathway of care; funding not reported

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Swinden & Barrett, 2008 Swinden D, Barrett M. Developing a dual diagnosis role within mental health. Nursing Times. 2008;104:26-27. Local report (+) Aims to describe the development and role of a dual diagnosis service	**The County Durham Dual Diagnosis Project**	Adult; any mental illness and drug/alcohol misuse	County Durham and Darlington; mixed	No	Yes; co-ordination between mental health and substance misuse services to minimise multiple assessments and provide a single care plan	Yes; provides a practitioner network, clinical supervision for dual diagnosis leads, ongoing support, information and training from DD leads to their teams within mental health and substance misuse services	This is a multi-agency dual diagnosis strategy which focuses in meeting service users' dual needs through a collaborative model of working. The model entails parallel care delivery from mental health and substance misuse care providers, with close collaboration and communication between services. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) involve local dual diagnosis network members in planning and presenting at events, (b) circulate members' queries to promote sharing of experience and practice, (c) promote a collaborative approach, (d) provide a tiered training and support structure from the dual diagnosis lead, (e) equip staff to work with dual diagnosis through ongoing, rolling training programmes, professional development and support, (f) promote the service widely both internally and externally	1x dual diagnosis worker/project manager	Integrated	Not reported	Unclear (no response)	Appraisal of service may be biased, report written by the acting nurse consultant; funding from Durham County Council Adult and Community Services, Durham DAAT, Darlington DAAT, six local PCTs and Co Durham and Darlington Priority Services NHS Trust (now Tees, Esk and Wear Valleys NHS Trust).
Trippier & Parker, 2008	**Westminster Dual Diagnosis**	Adult; serious mental	Westminster, London; urban	Yes; assessment and	Yes; co-ordination with	Yes; provision of clinical	The dual diagnosis team provide a service designed to manage substance-	3x specialist worker/nurs	Integrated	Not reported	Unclear (contact details	Provides a good outline of service,

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Trippier J, Parker S. Reflections on the role of the specialist dual diagnosis clinician. Advances in Dual Diagnosis. 2008;1:14-19. Local report (+) Aims to describe the service model of a dual diagnosis service	**Team**	illness and drug/alcohol misuse		time-limited treatment	community mental health teams and inpatient services	supervision and dual diagnosis training for CMHT staff in Westminster and a dual diagnosis operational group ensures dissemination of information and consultation with other services in the borough	using service users within adult mental health services. All input from the dual diagnosis worker is carried out in partnership with the service user's care co-ordinator. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) strong clinical leadership of the team within a defined, sustained model, (b) regular auditing to measure efficacy, (c) development of specialist dual diagnosis practitioners working within a virtual team to increase autonomous working.	e posts 1x clinical lead			unavailable)	conclusions may be biased; funded by the local primary care trust and drug and alcohol team

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Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**The Amber Project**	LGBT service user's; serious mental illness and drug/alcohol misuse	London; urban	Yes, offers a counselling service for short and long-term therapy and group work	Yes, service users are supported to access other mainstream health and social services including housing, advocacy support and relapse prevention groups	No	The Amber Project is a partnership project run by CASA (a charity that provides support for people with drug and alcohol problems and multiple needs) and PACE (which provides mental health and well-being services to LGBT communities). The aim is to support users to become more aware of their psychological, emotional and interpersonal difficulties and reduce, control or stabilise their substance use. Key good practice points: (a) provide a LGBT specific service so that service users can be open about their sexuality, (b) allow service users to define their own goals and treatment needs, (c) offer the service in different locations to ease accessibility, (d) liaise with other services which the service user may visit in a safe and integrated manner.	2x psychotherapists (part-time)	Separate	Not reported	Unclear (contact details out of date)	Limited information about service; funded by a Section 64 Department of Health grant (£39,395 per annum for three years)
Turning Point, 2007	**The Croydon Dual**	Adult; serious mental	Croydon, London; urban	No	Yes, provides support and	Yes, delivers the five day pan-London	The Croydon Dual Diagnosis Service was set up with the active	1x dual diagnosis lead	n/a	Not reported	Unclear (no respons	Limited information about service;

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Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**Diagnosis Service**	illness and drug/alcohol misuse			consultancy to all staff in the borough who work with people who have a dual diagnosis	dual diagnosis course, drug and alcohol training, Mental Health Act training to the police, the trust's clinical risk assessment training and one-off training as required	involvement of local service user groups and started in October 2003. The focus has been providing training, support and consultancy to all staff in the borough who work with people who have a dual diagnosis, and to help to clarify care pathways. Key good practice points: (a) team have built strong working partnerships with a wide range of providers, (b) a joint steering group for dual diagnosis, integrated mental health and substance misuse is in place, (c)participants are encouraged to reflect on cultural differences, and the impact these have when working with service users.	2x dual diagnosis practitioners			e)	funding from the Department of health pooled treatment budget via the DAAT and the London Borough of Croydon Adult Social Services
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good	**Dual Diagnosis Course, York University**	n/a	York University	No	No	Yes, offers training in prevalence, risks, assessment, formulation, interventions, research and advocacy	This is a training course which aims to look at the complex relationship between substance use and mental health, examining the implications for service users, carers, workers, and services. The course length is 1 day/week for 6 weeks or half day/week for 12 weeks.	1x service user 1x nurse specialist 1x professor 1x clinicians with credibility and up to date experience with the client group	n/a	n/a	Yes	Limited information about service; jointly funded by the Workforce Development Confederation and the NTA

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practice and provide examples through the use of case studies							Key good practice points: (a) make dual diagnosis training relevant to people within the context in which they are working, (b) tailor each course to the needs of the people attending, (c) involve service users in the planning, delivery and evaluation, (d) involve facilitators who have either clinical or research credibility, (e) funding should include both statutory and independent sector to ensure a good mix of professionals attend the training.	1x senior researcher who has expertise in the evidence base				
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**The Friday Group**	Adult; serious mental illness and drug/alcohol misuse	Redbridge, London; urban	No	Yes, in addition to group activities invited external speakers (such as benefits advisors and debt counsellors) provide advice	No	This is a facilitated self-help group offering social/recreational activities, a shared meal and a discussion group. Over a one year period (April 2005-2006) 39 people attended. Accessibility and acceptability not reported. Key good practice points: (a) group members are given feedback on service development initiatives, (b) providing a service around service users' stated needs helps with service engagement, (c) treatment needs to be long-term and	Staff from CMHTs and substance misuse services who act as facilitators	Separate	2 hours per week	No	Limited information about service; Redbridge DAAT provided the £4,000 yearly running costs for 2006/2007. Staffing costs are borne by the CMHTs and drug and alcohol service

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							focused, (d) develop the service in consultation with users and through outreach to ensure it is appropriate to their needs					
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**Humber Mental Health Teaching Trust Dual Diagnosis Liaison Service**	n/a	Yorkshire and the Humber; mixed	No	Yes, provides advice, guidance on good clinical practice and liaising between substance misuse and mental health services	Yes, provides informal and formal training sessions, and information resource, modelling of interventions , supervision and co-working	The aim of the service is to support mainstream mental health staff in assessing and delivering interventions to service users who have a dual diagnosis. Key good practice points: (a) staff who work in the team need to have a high level of expert knowledge and skills in relation to mental health, substance misuse and dual diagnosis, (b) direct clinical work of the dual diagnosis clinicians enhances their ability to adapt mental health and substance misuse interventions to meet the needs of service users, (c) service users are involved in training and group work.	3x addiction nurses 1x nursing team leader	Integrated	Not reported	Unclear (no response)	Limited information about service; funded partly by mental health income from two PCTs (Hull and the East Riding of Yorkshire)
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007	**Intensive Management of Personality Disorder: Assessment and**	Adult; non-forensic personality disorder and drug/alcohol misuse	North east London; urban	Yes, offers assessment, treatment (evidence-based psychological	No	Yes, provides supervision and a five module training package on working with	Provides a highly targeted service with a strong emphasis on bringing users together to share ideas about recovery and to receive ongoing support after leaving the service. All service users receive	2x nurses 1x clinical psychologist 1x CBT psychotherapist 2x assistant	Separate	Not reported	Yes	Limited information about service; funding is through existing commissioning structures,

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**Recovery Team (IMPART)**			therapies) and advocacy for service users and their carers		personality disorder and substance misuse for any services in the local authority area, and external consultation	three to six weeks of motivational enhancement to help them explore the change process. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) good and regular communication with all staff for effective risk assessment, management and staff co-operation, (b) make sure service users feel heard when voicing concerns or complaints and that visible change occurs in response, (c) separate the role of care-co-ordinator from the role of psychological therapist where possible	psychologists 1x occupational therapist 1x consultant clinical psychologist 2x administrative staff				with some additional funding from the DAAT
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide	**The Lewisham Dual Diagnosis Service**	Adult; serious mental illness and drug/alcohol misuse	Lewisham, London; urban	Yes, provision of direct clinical work	Yes, the team facilitate care pathways between services	Yes, provides training, practice development and support dual diagnosis work in partner agencies	This service promotes an integrated model of care in which people with mental health and substance use problems have both issues addressed concurrently, in one setting, by one team. In the period between April 2006 and April 2007, the total number of referrals was 264. Accessibility and acceptability not reported.	1x team leader 6x dual diagnosis practitioners 1x addictions consultant psychiatrist (one session/month)	Integrated	Not reported	Unclear (no response)	Limited information about service; funding is primarily from the Drug and Alcohol Strategy Team (DAAST) and PCT pooled treatment budget.

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examples through the use of case studies							Key good practice points: (a) ensure dual diagnosis practitioners are supported to maintain their substance misuse capabilities, (b) give practitioners the opportunity to exchange roles within the team to enhance skills and promote retention, (c) important to have dual diagnosis workers in both inpatient and community services to promote continuity of care across sectors, (d) create a model for developing local dual diagnosis practice and ensure it is regularly reviewed by the team.					
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**Nottinghamshire Dual Diagnosis Service**	Adult; serious mental illness and drug/alcohol misuse	Nottinghamshire; mixed	Yes, face-to-face work with service users to help them tackle their complex needs	Yes, liaison with services (mental health and substance misuse)	Yes, staff supervision and support – individually or in groups, training and teaching of students and other healthcare and related professionals	The service offers a consultancy role to mental health services to promote liaison between substance misuse and mental health services. The aim is to develop more effective relationships and promote more seamless patient care. The service works across all Trust mental health teams and other non-statutory sector agencies in a wide range of settings including GP practices, forensic wards, drug and mental health services, and statutory	1x nurse consultant 8x clinicians 1x addiction consultant psychiatrist (1 session/week) Administrative support	Integrated	Not reported	Unclear (no response)	Limited information about service; funded through the city and county DAATs. The budget is £450,000 (this excludes prescribing costs which are largely met by the PCT)

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							substance misuse services. Accessibility, acceptability, service utilisation. Key good practice points: (a) staff members need a high level of expert knowledge and skills in relation to mental health, substance misuse and dual diagnosis, (b) direct clinical work of the dual diagnosis clinicians enhances their ability to adapt interventions to meet the needs of service users, (c) service users are involved in training and group work.					
Turning Point, 2007 Turning Point. Dual Diagnosis: Good practice handbook. London. 2007 Good practice handbook (++) Aims to outline the components of good practice and provide examples through the use of case studies	**Turning Point Support Link**	Adult; serious mental illness and drug/alcohol misuse	West Hertfordshire; mixed	Yes, offers practical and emotional support	Yes, staff work closely with service users and other agencies to develop individually tailored support plans	No	This is an outreach project providing support for people with a dual diagnosis living in the community. All referrals come from the local CMHTs. The caseload varies between 6 and 12 depending on the support needed. Accessibility, acceptability and service utilisation not reported. Key good practice points: (a) provide a holistic service which works for a range of complex needs, (b) build positive	1x service manager 1x team leader 6x project workers	Separate	Can provide one to three hours of support per service user each week	Unclear (contact details out of date)	Limited information about service; funded through Hertfordshire's Joint Commissioning Team

Study, design and aims	Service	Population; client group	Geographical region; location	Direct provision of care?	Provision of advice and co-ordination?	Provision of training, education and/or networking ?	Description of service including accessibility, acceptability, service utilisation and key good practice points	Service staffing	Separate or integrated service	Availability of service?	Service still running ?	Limitations/ comments; source of funding
							relationships with service users, (c) adopt a long-term perspective, (d) maintain clear and consistent boundaries, (e) support service users to engage with existing services, (f) staff should have a good knowledge if local services and agencies and ensure good links are built.					