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

Draft Review 4: Which service models for health, social care and voluntary and community sector organisations are cost-effective and efficient at meeting the needs of people with a severe mental illness who also misuse substances?

Mr Eric Slade, Ms Sarah Stockton and Prof. Steve Pilling

National Collaborating Centre for Mental Health (NCCMH)

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TABLE OF CONTENTS

GLOSSARY AND ABBREVIATIONS

AA: Alcoholics Anonymous.

ACT: assertive community treatment.

ASI: the Addiction Severity Index is a semi-structured interview used for substance abuse treatment planning and evaluation. The ASI has 163 items, and each item is rated on a 4-point scale from 0 (not at all) to 4 (extremely). The index generates 7 composite scores; Medical, Employment, Alcohol use, Drug use, Legal, Family/social and Psychiatric. Each of these is on a scale from 0 (lowest severity) to 9 (greatest severity). The ASI-Lite version is a shortened version of the ASI. The ASI-Lite contains 22 fewer questions than the ASI, and omits items relating to severity ratings, and a family history grid.

AUDIT: the Alcohol Use Disorders Identification Test 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.

Base-case analysis: utilises the best estimates for the model input parameters.

BASIS-32: the Behavioural and Symptom Identification Scale-32 has 5 subscales. Each item is rated on a 5-point scale, from 0 indicating least difficulty to 4 indicating greatest difficulty. Subscale and overall mean scores range from 0 to 4; lower score better.

Before-after study: a type of study where the dependent variables are measured before and after an intervention has been delivered. The intervention can either be delivered by the investigator or by others (observational before and after study). An approach that is often called a pre–post study.

BHRS: Behavioral Healthcare Rating of Satisfaction; higher score better.

Bootstrapping: a non-parametric technique which involves large numbers of repetitive computations to estimate the shape of a statistic's sampling distribution empirically. Using the bootstrap approach, repeated random samples of the same size as the original sample are drawn with replacement from the data. The statistic of interest is calculated from each resample, and these bootstrap estimates of the original statistic are then used to build up an empirical distribution for the statistic.

BPRS: the Brief Psychiatric Rating Scale (24 items is a brief measure of psychiatric symptoms. It is designed to be completed during a clinical interview and consists of 24 items, each scored on a Likert scale from 1 (not present) to 7 (extremely severe). Scores range from 24 to 168 with higher scores indicating greater severity of psychopathology.

CANSAS: the Camberwell Assessment of Need Short Assessment Schedule has possible scores range from 0 to 22, with higher scores indicating more needs.

CA-QOL: California Quality of Life Inventory; higher scores are associated with better quality of life.

CBT: cognitive behavioural therapy.

CES-D: the Center for Epidemiological Studies Depression Scale is a screening measure for symptoms of depression, as defined by the DSM-V. It is administered online and has 20 items each rated on a scale from 0 (not at all) to 4 (nearly every day for 2 weeks). The score range is 0-60, with scores above 16 indicating possible clinical significance; lower score better.

CI: confidence interval.

CMHT: community mental health team.

Cost–consequences analysis: one of the tools used to carry out an economic evaluation. This compares the costs (such as treatment and hospital care) and the consequences (such as health outcomes) of a test or treatment with a suitable alternative. Unlike cost–benefit analysis or cost–effectiveness analysis, it does not attempt to summarise outcomes in a single measure (such as the quality-adjusted life year) or in financial terms. Instead, outcomes are shown in their natural units (some of which may be monetary) and it is left to decision-makers to determine whether, overall, the treatment is worth carrying out.

Cost-effectiveness analysis: assesses the cost of achieving a benefit by different means. The benefits are expressed in non-monetary terms related to health, such as symptom-free days, heart attacks avoided, deaths avoided or life years gained (that is, the number of years by which life is extended as a result of the intervention).

Cost–utility analysis: one of the tools used to carry out an economic evaluation. The benefits are assessed in terms of both quality and duration of life, and expressed as quality-adjusted life years.

CSQ or CSQ-8: the Client Satisfaction Questionnaire has possible scores range from 1 to 32, with higher scores indicating greater satisfaction with care arrangements.

CUAD: Chemical Use, Abuse, and Dependency Scale; lower score better.

DALI: the Dartmouth Assessment of Lifestyle Instrument has 9 alcohol questions, with summed and possible scores ranging from -4 to +6. Anyone scoring 2 or higher on the alcohol scale is at high risk for having a current alcohol-use disorder (a diagnosis of abuse or dependence). The 8 questions that comprise the drug scale yield possible scores of +4 to -4. People scoring above -1 on this scale are at high risk for cannabis and/or cocaine use disorders.

DIS: Diagnostic Interview Schedule is a fully structured questionnaire designed to ascertain the presence or absence of major psychiatric disorders as outlined in the

Diagnostic and Statistical Manual of Mental Disorders by American Psychiatric Association.

EQ-5D: the European Quality of Life – 5 Dimensions is a standardised instrument for use as a measure of health outcome.

HRQoL: health-related quality of life.

IACT: integrated assertive community treatment.

ICER: incremental cost-effectiveness ratio the difference in cost between two possible interventions (strategies, courses of action, etc.), divided by the difference in their effect.

LSP: the Life Skills Profile is a measure of aspects of functioning that affect how successfully people with a diagnosis of schizophrenia can care for themselves. The original version (the LSP-39) has 39 items rated 4 (always) to 1 (never) and 5 subscales; 1) self-care, 2) non-turbulence, 3) social contact, 4) communication and 5) responsibility. Higher scores indicate high levels of life skills.

MANSA: Manchester Short Assessment of Quality of Life is a measure of quality of life. It has 25 items that are rates either dichotomously (yes/no) or on a scale of 1 ('Couldn't be worse') to 7 ('Couldn't be better'); higher scores indicate better quality of life.

MAP: Maudsley Addiction Profile. Possible scores can range from 0 to 40; lower score better.

n: number of participants.

N: number of studies.

NA: not applicable.

NHS: National Health Service.

PTSD: post-traumatic stress disorder.

QALY: quality-adjusted life year. A measure of the state of health of a person or group in which the benefits, in terms of length of life, are adjusted to reflect the quality of life. One QALY is equal to 1 year of life in perfect health. QALYs are calculated by estimating the years of life remaining for a patient following a particular treatment or intervention and weighting each year with a quality of life score (on a zero to 1 scale). It is often measured in terms of the person's ability to perform the activities of daily life, freedom from pain and mental disturbance.

QoL: quality of life.

RCT: randomised controlled trial. A study in which a number of similar people are randomly assigned to 2 or more groups to test a specific drug or treatment. One

group (the experimental group) receives the treatment being tested, the other (the comparison or control group) receives an alternative treatment, a dummy treatment (placebo) or no treatment at all. The groups are followed up to see how effective the experimental treatment was. Outcomes are measured at specific times and any difference in response between the groups is assessed statistically. This method is also used to reduce bias.

RFS: Role Functioning Scale. Four single rating scales for evaluating the functioning of individuals in specified areas of everyday life. The values on each of the 4 scales range from 1, which represents a very minimal level of role functioning, to 7, the hypothetically optimal level of role functioning. The 4 role scores summed represent a Global Role Functioning Index with scores ranging from 4 to 28, the higher score better.

RQ: review question.

SAS-II: Social Adjustment Scale-II. This is an adaptation of the Social Adjustment Scale intended to assess the social adjustment of schizophrenic patients. The SAS-II contains 52 questions which are administered in a semi structured interview format and includes work role, sexual adjustment, romantic involvement, parental role, extended family relationships, social leisure activities, personal well-being and relationships with principal household member; higher score better.

SATS: Substance Abuse Treatment Scale. This is a clinician-rated measure of the person's stage of substance abuse treatment over the past 6 months, scored on a scale from 1 (pre-engagement) to 8 (in remission or recovery).

SC: standard care.

SCM: standard case management.

SD: standard deviation.

Sensitivity analysis: a form of modelling that evaluates the impact of alternative values for some of the model parameters. Often used when there is significant uncertainty about the value of the parameter.

SF-12: the 12-item Short Form Health Status Questionnaire is a shorter version of the SF-36, the 36-item Short Form Health Survey which is a standardised questionnaire used to assess patient health across 8 dimensions, with varying number of questions in each domain, and within each dimension responses are scored and then transformed onto 0 to 100 scale. Dimensions include physical functioning, role limitations – physical, bodily pain, general health, vitality, social functioning, role limitations – emotional, mental health. The 8-dimension scores of the SF-36 are intended to be presented separately. However, it is possible to combine SF-36 responses into 2 summary scores of physical and mental health; these are usually described as the physical component summary (PCS) and the mental component summary (MCS); higher score better.

SLS: Satisfaction with Life Scale; higher score better.

SMI: severe mental illness.

TPQ: the Treatment Perceptions Questionnaire is 10-item questionnaire that also allows open-responses/feedback designed to assess service user satisfaction. A global score is obtained by summing the scores of all items. It was developed at the National Addiction Centre in London. It examines the perception of service users towards: first, the nature and extent of their contact with a treatment programme's staff team (5 items); and second, aspects of the operation of the treatment service and its rules and regulations (5 items). Items are scored on a 5-point scale (strongly disagree to strongly agree; weighted 0-4). Higher scores reflect greater satisfaction with treatment.

Time trade-off: a method of measuring health state utilities (preference for, or desirability) of a particular outcome.

Utility: in health economics, the measure of the preference or value that an individual or society places upon a particular health state. It is generally a number between 0 (representing death) and 1 (perfect health).

1 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).

The NCCMH was commissioned by the NICE Centre for 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 a dual diagnosis. This systematic review of the existing economic evidence for individuals with a dual diagnosis living in the community in the UK is the last of these 4 evidence reviews.

This review considered existing economic studies conducted alongside either randomised controlled trials (RCTs) or observational studies, and also modelling studies in order to address the following review question:

- RQ 4: Which service models for health, social care and voluntary and community sector organisations are cost-effective and efficient at meeting the needs of people with a severe mental illness who also misuse substances?

This review was conducted in accordance with *Developing NICE Guidelines: The Manual* (NICE, 2014). A systematic search was conducted in 18 (all relevant and accessible) electronic databases for RQ 4. For identification of health economic and quality of life (QoL) studies searches were restricted to 8 databases. For identification of data to populate de novo economic modelling all 18 databases were searched. All of the searches were restricted to evidence published from 1990 onwards.

Overall, 8 economic studies (in 11 publications) met the inclusion criteria; of these only 1 study was conducted in the UK. All the remaining 7 studies were conducted in the US. Three studies evaluated the cost effectiveness of integrated treatment; 3 studies evaluated the costs and consequences of integrated treatment; 1 study evaluated only the costs of integrated treatment; and 1 study evaluated the cost effectiveness of staff training intervention.

Of the 8 studies, 5 studies were undertaken alongside RCTs and the remaining 3 studies were based on a before-after study design. Only the UK-based study was judged to be directly applicable to the UK and NICE decision-making context and all the remaining studies were judged to be partially applicable. Three studies were characterised by minor methodological limitations [++], 4 studies by potentially serious methodological limitations [+], and 1 study by very serious methodological limitations [-].

The systematic review and meta-analysis of clinical evidence for review question 3 did not identify convincing evidence for the effectiveness of service delivery models focused on delivering care for people with a dual diagnosis. Given the lack of

convincing clinical evidence for the effectiveness of service delivery models we undertook a cost analysis examining the impact of a hypothetical treatment engagement intervention to improve the engagement with standard care (SC) services for people with a dual diagnosis living in the community. The cost analysis assessed whether the costs of providing a treatment engagement intervention would be offset by future cost savings resulting from reduced hospital admissions. The economic analysis we conducted was judged to be directly applicable to the UK and NICE decision-making context and was characterised by potentially serious methodological limitations [+].

The key findings from these studies and economic analysis undertaken for this review are summarised below in economic evidence statements.

Review question 4: Which service models for health, social care and voluntary and community sector organisations are cost-effective and efficient at meeting the needs of people with a severe mental illness who also misuse substances?

Assertive community treatment

Evidence statement 4.1: Assertive community treatment (ACT) compared with standard care (SC) or another active intervention

There was high to moderate-quality evidence on costs and consequences from 2 US studies (2[++][1,2]) comparing ACT with SC or another active intervention.

One US-based cost-effectiveness analysis [++][1] found that the integrated treatment based on ACT resulted in lower public sector costs and better outcomes (that is, it was the dominant intervention) when compared with SC. ACT resulted in a reduction of $6,067 (p=ns) in public sector (including informal care) per-person costs over 3 years. ACT also resulted in greater improvement in substance use outcomes measured on the Substance Abuse Treatment Scale (SATS). The mean SATS scores improved by 2.3 points and 2.1 points for ACT and SC, respectively. The mean cumulative SATS ratings were higher by 0.45 points for ACT (p=ns) when compared with SC. ACT also resulted in greater improvement in adaptive functioning outcomes when measured using quality of life (QoL) scores and quality adjusted life years (QALYs). The mean QoL scores improved by 0.10 points and 0.04 points for ACT and SC, respectively (p=ns). The mean QALYs difference was 0.03 QALYs in favour of the ACT over 3 years (p=ns).

One US-based cost–consequences analysis [++][2] found that the integrated ACT (IACT) model resulted in significantly lower public sector costs when compared with ACT ($61,861 versus $85,798, p<0.05) over 24 months. The difference between IACT and SC of $5,532 was not statistically significant. Also, service users receiving IACT and ACT reported an improvement in acceptability of services. Service users were significantly more satisfied than service users in the SC group (p=0.03). There was no statistically significant difference in the acceptability of services (in terms of satisfaction levels) between IACT and ACT groups (p=0.12). Service users receiving IACT reported better adaptive functioning (in terms of stable housing days). The mean stable housing days were 57.67 for IACT, 55.61 for ACT, and 39.48 for SC. There were no statistically significant differences in mental health outcomes measured using Brief Psychiatric Rating Scale, and substance use outcomes measured using severity of alcohol and drug use, and number of days of substance use.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because both studies were conducted in the US and the Committee believed that the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. In 1 study QALYs were estimated; however, utility values were derived using non-validated measure that was developed by the authors specifically for this study. None of the

studies considered other important outcomes including housing needs, employment, dependence on benefits, and levels of admissions to secure settings.

[1] Clark et al. (1998) [++]
[2] Morse et al. (2006) [++]

Integrated treatment

Evidence statement 4.2: Integrated treatment compared with standard care (SC)

There was low-quality evidence on costs and consequences from 1 US study [+][1] comparing integrated treatment with SC.

The US-based cost–consequence analysis found that integrated treatment resulted in cost savings of $2,797 over 2 years after implementation of the programme. At 3 years, integrated treatment when compared with SC resulted in statistically significant improvements in mental health outcomes (Kennedy Axis V Scale; 12-item Short Form Health Status Questionnaire Mental Health Scale; Behavioural and Symptom Identification Scale-32 [BASIS-32] psychosis, depression, and anxiety domains); substance use outcomes (BASIS-32 Impulsive/Addictive domains); and adaptive functioning (Daily Living Skills domain on the BASIS-32; Rosenberg Self-Esteem Scale; California Quality of Life Inventory; and legal status). There was no significant change over time between intervention and SC in substance use outcomes when measured using Addiction Severity Index -Lite, adaptive functioning (in terms of employment status), or service users' perceived health or medical status. Acceptability of services (in terms of consumer satisfaction, measured on the Behavioral Healthcare Rating of Satisfaction) was consistently above the means for the normative programme scores.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because the study was conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings.

[1] Judd et al. (2003) [+]

Integrated treatment based on case management – cost analysis

Evidence statement 4.3: Integrated treatments based on case management, Alcoholic Anonymous (AA)/12-Steps, and behavioural skills compared with standard care (SC)

There was low-quality evidence from 1 US study [+][1] comparing costs associated with integrated treatments based on case management, AA/12-Steps, and behavioural skills with SC.

The US-based cost analysis [+][1] found that integrated case management treatment resulted in a greater public sector cost reduction over 18 months when compared with both integrated behavioural skills and integrated AA/12-Steps treatments. The integrated case management treatment resulted in a reduction of 41% in public sector costs, the integrated behavioural skills treatment resulted in a reduction of 16%, and the integrated AA/12-Steps treatment resulted in a reduction of 37% when compared with SC. It was unclear whether these cost reductions were statistically significant.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because the study was conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. The study hasn't considered consequences.

[1] Jerrell. (1996) [+]

Integrated treatment based on case management – cost-effectiveness analyses

Evidence statement 4.4: Integrated treatments based on case management, Alcoholic Anonymous (AA)/12-Steps, and behavioural skills compared with each other, or with standard care (SC)

There was low-quality evidence on costs and consequences from 2 US studies (2[+][1,2]) comparing integrated treatments based on case management, AA/12-Steps, and behavioural skills with each other, or with SC.

One US-based cost-effectiveness analysis [+][1] found that the integrated case management treatment resulted in lower per-person public sector costs and greater improvement in adaptive functioning when measured on the Social Adjustment Scale-II (SAS-II) and the Role Functioning Scale (RFS) over 24 months when compared with both integrated behavioural skills and integrated AA/12-Steps treatments. The public sector cost over 24 months associated with the integrated case management treatment was $6,375, with the integrated behavioural skills treatment was $9,665, and with the integrated AA/12-Steps treatment was $11,752. The total SAS-II scores were 77.44 for the integrated case management treatment, 77.03 for the integrated behavioural skills treatment, and 74.22 for the integrated AA/12-Steps treatment. When using SAS-II as an outcome measure the integrated case management treatment was dominant (that is, it resulted in lower costs and better SAS-II scores). The RFS scores were 11.46 for the integrated case management treatment, 13.30 for the integrated behavioural skills treatment, and 11.09 for the integrated AA/12-Steps treatment. When using the RFS as an outcome measure the integrated AA/12-Steps treatment was dominated by both integrated case management and integrated behavioural skills treatment (that is, the integrated case management treatment resulted in higher costs and lower scores on the RFS scale). The integrated behavioural skills treatment (when compared with the case management treatment) resulted in an incremental cost-effectiveness ratio of $7,152 per additional point improvement on the RFS scale. It was unclear whether costs and outcomes were statistically different between treatments.

One US-based cost–consequences analysis [+][2] found that the integrated case management treatment resulted in public sector cost savings at 6 and 12 months after implementation of the programme compared with SC services that were provided before the implementation of integrated treatment. At 6 months after implementation of the programme the cost savings for the integrated case management amounted to $2,830 and at 12 months to $2,211. Using integrated case management treatment compared with SC services resulted in an improvement in adaptive functioning when measured on the Social Adjustment Scale (SAS) family relations domain of 1.67 and 1.56 at 6 and 12 months, respectively ($p \leq 0.05$). Using integrated case management treatment compared with SC services also resulted in an improvement in adaptive functioning when measured on the RFS scale of 0.46 and 0.65 points at 6 and 12 months, respectively ($p \leq 0.01$). There was no change over time in adaptive functioning when measured on the SAS (housing stability, social contacts and work affect domains); mental health outcomes (Diagnostic Interview Schedule); substance use outcomes (Chemical Use, Abuse, and Dependency Scale); and acceptability of services (Satisfaction with Life Scale and Client Satisfaction Questionnaire-8).

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because both studies were conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings. Also, 1 of the studies adopted a narrow public sector perspective.

[1] Jerrell & Ridgely. (1999) [+]
[2] Jerrell et al. (2000) [+]

Other intervention

Evidence statement 4.5: Staff training versus standard care (SC)

There was moderate-quality modelling evidence on cost effectiveness from 1 UK study [++][1] comparing a staff training intervention with SC.

The UK-based cost-effectiveness analysis found that the staff training intervention resulted in an increase of £1,033 in public sector costs when compared with SC over 18 months. The staff training intervention also resulted in an improvement in mental health outcomes measured on the Brief Psychiatric Rating Scale (BPRS) (improvement of 4.2 points, ($p<0.001$)) and on the Camberwell Assessment of Need Short Assessment Schedule (CANSAS) (improvement of 0.84 points, ($p=0.04$)).There was also an improvement in adaptive functioning when measured on the Life Skills Profile (LSP) (improvement of 1.31 points, ($p=0.49$)) and on the Manchester Short Assessment of Quality of Life (MANSA) scales (improvement of 0.62 points, ($p=0.79$)). There was worsening in acceptability of services when measured on the Client Satisfaction Questionnaire (CSQ); worsening of 0.99 points ($p=0.79$). However, there was an improvement in acceptability of services when measured on the Treatment Perceptions Questionnaire (TPQ); an improvement of 0.68 points ($p=0.62$). Based on the above costs and outcomes, the staff training intervention resulted in incremental cost-effectiveness ratios of: £246 per additional point of improvement on the BPRS; £1,230 per additional point of improvement on the CANSAS; £789 per additional point of improvement on the LSP; £1,666 per additional point of improvement on the MANSA; and £1,519 per additional point of improvement on the TPQ. SC was dominant when using the CSQ as an outcome measure (SC resulted in lower cost and better outcome).

No economic evidence on other complex interventions such as brokerage case management, contingency management, time-limited care coordination, shelter-based psychiatric clinics, supportive housing, and supportive text messaging used in the management of people with a dual diagnosis is available.

Applicability to the UK and NICE decision-making context:

The study is directly applicable to the UK and NICE decision-making context. The study was conducted in the UK and adopted the public sector perspective.

[1] Craig et al. (2008) [++]

Integrated treatment- economic analysis

Evidence statement 4.6: Treatment engagement intervention compared with standard care (SC) (an economic analysis conducted for this review)

There was low-quality evidence on costs from an economic analysis (threshold analysis) [+][1] conducted for this review comparing a treatment engagement intervention with SC services.

Evidence from the economic analysis (threshold analysis) [+] found that, when assuming an efficacy rate of 10%, the treatment engagement intervention would lead to an incremental cost of £42 per person over 1 year when compared with SC alone. However, when the efficacy rate is 12%, the intervention would become cost saving. Moreover, when assuming the efficacy rate of 10% and the difference of 0.002 in quality adjusted life years (QALYs) between the intervention and SC per person the incremental cost-effectiveness ratio of the intervention would be below the lower NICE cost-effectiveness threshold of £20,000 per QALY. The cost savings are likely to be underestimated since the analysis has not considered wider health, social care, and public sector costs; and adopted a short time horizon.

Applicability to the UK and NICE decision-making context:

The economic analysis is directly applicable to the UK and NICE decision-making context. The analysis has adopted NHS and personal social services perspective; and estimated the required QALY gain for the intervention to be considered cost effective.

[1] Economic analysis conducted for this review [+]

2 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 a severe mental illness and substance misuse (dual diagnosis). This review is the last 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 dual diagnosis.
- Review 2 considers the service users, their family or carers, provider and commissioner views and experiences of health and social care community services for people with a dual diagnosis.
- Review 3 considers the effectiveness and efficiency of different service delivery models for people with a dual diagnosis.
- Review 4 considers the cost effectiveness and efficiency of different service delivery models for people with a dual diagnosis.

2.1 CONTEXT IN WHICH THE REVIEW IS SET

Severe mental illness (including schizophrenia, psychosis and bipolar disorder) coexists with drug and alcohol misuse in approximately 40% of users of secondary care mental health services. There is good evidence to suggest that outcomes for people with a dual diagnosis are worse than for other groups of service users who engage with health and social care services, and that they also have problems accessing services and are more likely to disengage with services (Mitchell et al., 2009; Crome et al., 2009). Furthermore, people with a dual diagnosis are more likely than other groups to have contact with the criminal justice system (Theriot & Segal, 2005).

Given the poor outcomes (and associated higher costs), there have been numerous attempts to provide better services for people with a dual diagnosis (McCrone et al., 2000). Attempts to improve treatment outcomes can broadly be divided into 2 approaches. The first involved the development of specialist treatments, which have often taken the form of complex packages of care involving interventions known to be effective for either severe mental illness (for example, cognitive behavioural therapy [CBT]) or substance misuse (for example, motivational interviewing). The second involved the development of particular models of care delivery often built around a specialised team (for example, assertive community teams or intensive case management). The former might be characterised as trying to achieve maximum therapeutic benefit, the latter aimed to improve engagement with services.

Both models of service have influenced the delivery of care for dual diagnosis in England. Initial responses focused on the development of specialist dual diagnosis teams but few services were actually developed because it became evident that a high proportion of people with a dual diagnosis were already managed by standard services; and this, in fact, would have led to the creation of two parallel services. Few if any such specialist teams still exist and where they do their role has moved away from the direct provision of care to providing a training and consultation role to

community mental health services. The development of specialist therapeutic interventions has not gained much traction in England – again the approach that has been followed has been in supporting the delivery of interventions in the context of community mental health services.

The response to the failure of the 2 approaches to establish a distinct role in mental health services has been to promote integration of both assertive engagement and specialist treatments into routine care. Common methods for doing this have been either the consultation and advice model (currently adopted by a number of services where a nurse specialist or specialist teams provide the service) or the appointment of 1 or more specialist staff members to a community mental health team (CMHT). This integrated model is currently the most common model but it is far from established in most mental health trusts. Staff turnover has been a major problem in maintaining the specialist staff member model.

2.2 AIMS AND OBJECTIVES

To contribute to the guideline's development by providing evidence on the cost effectiveness of service delivery models for people with a dual diagnosis.

2.3 REVIEW QUESTION AND PROTOCOL

The review protocol, including the review question and the eligibility criteria used for this review, can be found in Appendix 1.

2.4 OVERVIEW OF APPROACH

This work consists of:

- a systematic literature review of existing economic evidence (Sections 3 and 4), and
- de novo economic modelling (Sections 5 and 6).

The systematic review of economic literature was conducted, aiming at reviewing published economic evaluations that assess which service models for health, social care and voluntary and community sector organisations are cost effective and efficient in meeting the needs of people with a dual diagnosis.

At the protocol stage de novo economic modelling assessing the cost effectiveness or cost–utility of different service models was planned, in anticipation of a paucity and uncertainty of existing evidence. The effectiveness component of the de novo model would be informed by meta-analysis of studies conducted for review question 3 (RQ3); however, review 3 failed to identify convincing evidence for the effectiveness of service delivery models focused on delivering care for people with a dual diagnosis. Given the lack of convincing clinical evidence a cost analysis, examining the impact of a hypothetical intervention to improve the engagement with SC services for people with a dual diagnosis living in the community, was undertaken.

3 SYSTEMATIC LITERATURE REVIEW - METHODS

3.1 LITERATURE AND DATABASE SEARCH

Based on the scope, a systematic search strategy was developed, in collaboration with the NICE team, to identify relevant evidence published between 1990 and 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.

Two sets of searches were undertaken, one for health economic and QoL studies, and the other for data to populate the de novoeconomic modelling.
Searches were conducted in the following databases:

- Applied Social Sciences Index and Abstracts (ASSIA)
- *Cost-Effectiveness Analysis (CEA) Registry
- Cochrane Central Register of Controlled Trials (CENTRAL)
- Cochrane Database of Reviews of Effect (DARE)
- Cochrane Database of Systematic Reviews (CDSR)
- *Econlit
- *EconPapers
- *Embase
- Evidence for Policy and Practice Information and Co-ordinating Centre (EPPI) Centre databases – Bibliomap and Database of Promoting Health Effectiveness Reviews (DoPHER)
- *Health Technology Assessment Database (HTA database)
- International Bibliography of the Social Sciences (IBSS)
- *MEDLINE and MEDLINE in Process
- *NHS Economic Evaluations Database (NHS EED)
- *PsycINFO
- Social Care Online
- Social Science Citation Index
- Social Service Abstracts
- Sociological Abstracts.

* Search for health economic and QoL studies restricted to only these databases.

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 NICE and NCCMH technical teams 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 2.

Search restrictions included the following:

- date (publication limit 1990-current)
- language (English-language studies) limits
- animal studies removed from results
- searching Embase using only major Emtree headings
- health economic and QoL studies using an adaption of a filter developed by the Centre for Reviews and Dissemination, University of York (for identification of health economic and QoL studies only).

The following websites were searched:

- Campbell Collaboration
- European Observatory on Healthcare Systems and Policies
- Institute for Clinical Systems Improvement
- McMaster University Health Evidence
- NICE (guidelines and Evidence Search)
- National Institute for Health Research (NIHR) Health Services & Delivery Research Programme
- Public Health England (including National Treatment Agency for Substance Misuse)
- Public Health Wales
- Scottish Government
- Scottish Intercollegiate Guidelines Network (SIGN)
- Turning Research into Practice
- US National Guidelines Clearinghouse
- Welsh Government

In addition the following research registries were searched:

- ClinicalTrials.gov (US National Institutes of Health service)
- International Standard Randomised Controlled Trial Number (ISRCTN) Register

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. Additional hand searching of conference abstracts and references of recent high quality reviews was conducted to ensure all relevant trials were identified.

3.2 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 (Adult Substance Abuse Treatment Services) 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. Hermine 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 12th October 2015 with the aims of discussing de-novo economic modelling priorities, and identifying any relevant economic data and existing evaluations.

3.3 INCLUSION CRITERIA FOR ECONOMIC STUDIES

- Only English language papers were considered.
- Studies published from 1990 onwards were reviewed. This date restriction was imposed to obtain data relevant to current practice.
- Only studies from Organisation for Economic Co-operation and Development countries were included, as the aim of the review was to identify economic information transferable to the UK context.
- Inclusion and exclusion criteria for study population, diagnosis, intervention and comparator, and setting were exactly the same as outlined in the effectiveness review protocol 3 (see Appendix 3).
- Studies were included, provided that sufficient details regarding methods and results were available to enable the methodological quality of the study to be assessed, and provided that the study's data and results were extractable. Due to the lack of evidence, conference abstracts, dissertations, and commentaries were also included.
- Economic studies that consider both costs and consequences (cost-effectiveness, cost–consequence, cost–utility, cost-minimisation and cost–benefit analyses), and comparative cost studies were included in the review. Non-comparative costing studies, 'burden of disease' studies and 'cost of illness' studies were excluded.

3.4 APPLICABILITY AND QUALITY CRITERIA FOR ECONOMIC STUDIES

All existing economic papers eligible for inclusion were appraised for their applicability and quality using the methodology checklist for economic evaluations

recommended by NICE (NICE, 2014). Each study was rated ++, + or – to denote its methodological limitations, 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) and the study was classified as having minor methodological limitations.
- + 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 the study was classified as having potentially serious methodological limitations.
- – indicates that few or no checklist criteria have been fulfilled (and the conclusions are likely or very likely to alter) and the study was classified as having very serious methodological limitations.

The completed methodology checklists for all economic analyses considered in the guideline are provided in Appendix 4.

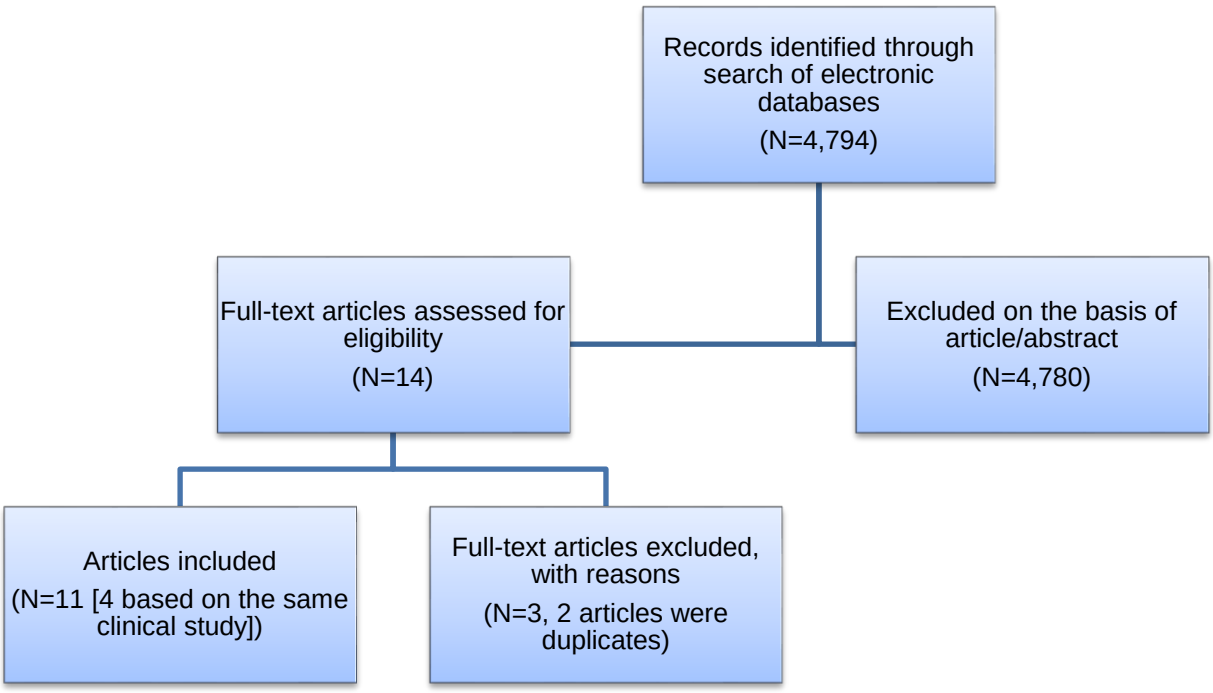
3.5 PRESENTATION OF ECONOMIC EVIDENCE

The summary of the economic evidence considered is provided in the evidence section 4. The references to reviewed studies are provided in Appendix 5 Appendix 1Appendix 5and the respective evidence tables with the study characteristics and results are provided in Appendix 6. The references to excluded studies are provided in Appendix 7.

3.6 RESULTS OF THE SYSTEMATIC SEARCH OF EXISTING ECONOMIC STUDIES

The titles of all studies identified by the systematic search of the literature were screened for their relevance to the topic (N=4,794). References that were clearly not relevant were excluded first. The abstracts of all potentially relevant studies (14 references) were then assessed against the inclusion criteria for economic evaluation by the health economist. Full texts of the studies potentially meeting the inclusion criteria (including those for which eligibility was unclear from the abstract) were obtained. Studies that did not meet the inclusion criteria, were duplicates, were secondary publications of 1 study, or had been updated in more recent publications were subsequently excluded. Economic evaluations eligible for inclusion (8 studies in 11 publications) were then appraised for their applicability and quality using the methodology checklist for economic evaluations. Finally, those studies that fully or partially met the applicability and quality criteria set by NICE were considered at formulation of the economic evidence statements. Figure 1 depicts a PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) diagram to show selection of publications.

Figure 1. The PRISMA diagram.



4 SYSTEMATIC LITERATURE REVIEW - RESULTS

The systematic search of the literature identified 7 studies (in 10 publications) that examined the costs and/or consequences of service delivery models for service users with a dual diagnosis (Clark et al., 1998; Jerrell, 1996; Jerrell & Hu, 1996; Jerrell & Wilson, 1996; Jerrell & Ridgely, 1995; Jerrell & Ridgely, 1999; Jerrell et al., 2000; Judd et al., 2003; Lambert et al., 2002; Morse et al., 2006). One UK study examined the cost effectiveness of staff training intervention (Craig et al., 2008). Only the UK-based study was judged to be directly applicable to the UK and the NICE decision-making context. All the remaining studies were judged to be partially applicable to the UK and NICE decision making as they were not UK studies. Three studies were rated [++], 4 studies were rated [+], and 1 study was rated [-].

Details on the methods used for the systematic review of the economic literature are described in section3. Completed methodology checklists of the studies are provided in Appendix 4. Full references of reviewed studies are provided in Appendix 5 and associated evidence tables for all economic evaluations reviewed are provided in Appendix 6. No additional potentially relevant studies were identified from Internet searches or enquiries to experts.

4.1 ASSERTIVE COMMUNITY TREATMENT

4.1.1 Clark et al., 1998

Aims and methods
Clark and colleagues (1998) evaluated the cost effectiveness of an integrated treatment for service users with a dual diagnosis in the US. The study population comprised adults with a dual diagnosis. Severe mental illness included schizophrenia, schizoaffective disorder, or bipolar disorder. Substances misused were not specified. The integrated treatment was defined as specialised treatment for people with a dual diagnosis delivered in an ACT team. The ACT team was located in a community mental health centre providing direct substance misuse treatment. This was compared with standard case management (SCM) with targeted substance misuse treatment based on an integrated model too. However, SCM provided less individual treatment for substance misuse, did not have team focus, and gave less intensive service.

The economic analysis was conducted alongside an RCT. Clinical effectiveness data were obtained from the study participants (n=223 at baseline; 203 at the 3-year follow-up). The resource use estimates were based on 193 study participants. Resource use was supplemented with data from management information systems, self-reports, clinical reports, hospital records, Medicaid payments, Medicare cost reports, and other local and state police, court, jail, prison, community mental health centres, and social service agencies. The analysis adopted a public sector perspective (health and social care and the criminal justice system) and informal care; costs consisted of: mental health treatment, general healthcare, legal services,

community services (shelters for the homeless and soup kitchens), the administrative cost of transfer payments, and informal caregiving from family members or friends. Unit costs were obtained from a variety of local sources including audited cost reports, public expenditure records, and service providers' financial records. The outcome measures included: the SATS, the Quality of Life Interview (only a subset of questions) and QALYs. The time horizon of the analysis was 3 years. Discounting was applied in an additional analysis using 3% and 5% for costs and outcomes, respectively.

Costs
According to the study findings, the mean total public sector cost (including informal care) per person over 3 years was higher in the SCM group; ($118,078 [standard deviation, SD, $81,437] for ACT versus $124,145 [SD $63,143] for SCM, a difference of $6,067 per person, p=ns, 1995 US dollars).

Outcomes – substance use
At the end of the 3 years, on the SATS the mean score was 5.1 and 4.9 for ACT and SCM group, respectively; a difference of 0.2 points. The mean cumulative ratings on the SATS over 3 years were higher in the ACT group (26.45 versus 26.00 in the ACT and SCM group, respectively).

Outcomes – adaptive functioning
At the end of the 3 years, subjective QoL scores were also higher in the ACT group (0.66 versus 0.65, in ACT and SCM group, respectively). Similarly, the mean QALYs were higher in the ACT group (1.77 versus 1.74 in ACT and SCM group, respectively). However, none of the differences between ACT and SCM were statistically significant.

Conclusions
Based on the above, ACT dominated SCM, as it resulted in better outcomes and lower service costs. However, none of the differences between ACT and SCM were statistically significant. According to the sensitivity analysis undertaken in the study the results were robust to changes in the estimates of informal caregiving and legal costs. Discounting did not significantly alter the results.

Applicability and limitations
The study is partially applicable to the UK and NICE decision-making context. The study was conducted in the US. QALYs were estimated; however, the study did not consider other important outcomes including housing needs, employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by minor methodological limitations including short time horizon; the estimates of baseline outcomes from an RCT; and the unit costs of resources from local sources.

4.1.2 Morse et al., 2006

Aims and methods
Morse and colleagues (2006) evaluated the costs and outcomes associated with IACT, ACT and SC in the US. The IACT team was provided with training on integrated treatment principles and services, included a substance misuse specialist, and also provided substance misuse services directly as part of the team. These

services included individual substance misuse counselling and bi-weekly treatment groups. The ACT team was referring people to other community providers for outpatient or individual substance misuse services and to 12-Step groups. SC comprised usual community care agencies that provided mental health and substance misuse treatment.

The study population comprised homeless individuals with a dual diagnosis. Severe mental illness included schizophrenia, schizoaffective disorder, atypical psychotic disorder, bipolar disorder, major depression-recurrent disorder, or delusional disorder. Substances misused included alcohol and/or drugs; cocaine was the most frequently used drug followed by cannabis.

The economic analysis was conducted alongside an RCT (Fletcher 2008). Clinical effectiveness and resource use data were obtained from the study participants (n=149). The resource use data were supplemented with information from service agencies, claims records, state and other local service provider information systems. The perspective of the analysis was that of the public sector (healthcare and social care). Costs consisted of outpatient visits (direct treatment for the IACT and ACT conditions, other mental health, other substance misuse treatment, physical healthcare, and psychosocial rehabilitation centre), inpatient admissions (mental health, substance misuse, and physical healthcare), emergency shelter, transfer payments and other maintenance benefits. Unit costs were obtained from local and national sources and included service provider and accounting and fiscal data, and Medicaid rates. The measures of outcomes included service user satisfaction (10-item scale developed for this project), stability of housing (days living in stable housing), the BPRS, a non-specified scale to measure the severity of both alcohol and drug use, substance use (number of days in the past 90 days that service users had used alcohol and also the number of days they used other substances). The time horizon of the analysis was 24 months. Outcomes and costs were reported for 6 months before programme entry, and then for 4 time periods: 1-6 months, 7-12 months, 13-18 months, and 18-24 months. Discounting was not applied on costs or outcomes.

Costs
According to the analysis, IACT resulted in a mean public sector cost per person of $11,618, $16,421, $15,195, $14,960, and $15,285 at 6 months before the study entry, 1-6 months, 7-12 months, 13-18 months, and 18-24 months post-study entry, respectively (2001 US dollars). ACT resulted in $13,579, $20,342, $21,035, $21,389, and $23,032 mean public sector costs per person; and SC resulted in $12,668, $14,427, $14,756, $14,370, and $12,776 mean public sector costs per person. The total public sector costs per person were $61,861 for IACT, $85,798 for ACT, and $56,329 for SC over 24 months post-study entry. IACT and SC resulted in significantly lower costs when compared with ACT ($p<0.05$). Difference between IACT and SC of $5,532 was not statistically significant.

Outcomes – mental health
For IACT the mean BPRS scores were 1.94, 1.82, 1.81, and 1.66 at 6 months, 12 months, 18 months and 24 months post-study entry, respectively. For ACT the mean BPRS scores were 2.01, 1.83, 1.97, and 1.88; and for SC the mean BPRS scores

were 1.98, 1.92, 1.98, and 1.86. There were no statistically significant differences between service models (p=0.10).

Outcomes – substance use
For IACT the mean substance misuse severity scores were 3.15, 3.07, 2.83, and 2.76 at 6 months, 12 months, 18 months and 24 months post-study entry, respectively; for ACT the mean substance misuse severity scores were 2.98, 2.86, 3.02, and 2.70; and for SC the mean substance misuse severity scores were 2.93, 2.78, 2.69, and 2.62.

For IACT the mean number of days of substance use were 6.88, 8.28, 7.85, and 7.43 at 6 months, 12 months, 18 months and 24 months post-study entry, respectively; for ACT it was 6.25, 6.06, 6.62, and 6.77 days; and for SC it was 6.34, 7.46, 7.10, and 6.42 days. The total number of days of substance use were 30.44 for IACT, 25.7 for ACT, and 27.32 for SC over 24-month period post-study entry. There were no statistically significant differences between the service delivery models.

Outcomes – acceptability of services
In terms of outcomes, IACT resulted in mean service user satisfaction ratings of 5.00, 5.10, 5.10, and 5.09 at 6 months, 12 months, 18 months and 24 months post-study entry, respectively; ACT resulted in ratings of 5.17, 5.23, 4.94, and 4.99; and SC resulted in ratings of 4.66, 4.75, 4.79, and 4.67. Service users in IACT and ACT were significantly more satisfied than service users in SC group (p=0.03); there was no statistically significant difference in satisfaction levels between IACT and ACT groups (p=0.12).

Outcomes – adaptive functioning
IACT resulted in 8.19, 14.18, 17.01, and 18.29 mean stable housing days at 6 months, 12 months, 18 months and 24 months post-study entry, respectively; ACT resulted in 5.77, 13.87, 18.19, and 17.78 days; and SC in 5.02, 11.34, 10.55, and 12.59 days. The total number of stable housing days per participant was 57.67 for IACT, 55.61 for ACT, and 39.48 for SC over 24 months' post-study entry. The difference between ACT and SC (16 days), as well as between IACT and SC (18 days) was statistically significant. However, the difference between ACT and IACT (2 days) was not statistically significant.

Conclusions
Based on the above findings, costs for IACT and SC groups were significantly lower than for ACT group. Also service users in the IACT and ACT groups were more satisfied with their treatment and reported more stable housing days. There was no difference between the groups in terms of psychiatric symptoms and substance use.

Applicability and limitations
The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US and adopted a narrow public sector perspective. No QALYs were estimated nor did the study consider other important outcomes such as employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by minor methodological limitations, including the short time horizon; the estimates of baseline outcomes from an RCT; only

healthcare and social care costs considered; some unit cost of resources from local sources.

Evidence statement 4.1: Assertive community treatment (ACT) compared with standard care (SC) or another active intervention

There was high to moderate-quality evidence on costs and consequences from 2 US studies (2[++][1,2]) comparing ACT with SC or another active intervention.

One US-based cost-effectiveness analysis [++][1] found that the integrated treatment based on ACT resulted in lower public sector costs and better outcomes (that is, it was the dominant intervention) when compared with SC. ACT resulted in a reduction of $6,067 (p=ns) in public sector (including informal care) per-person costs over 3 years. ACT also resulted in greater improvement in substance use outcomes measured on the Substance Abuse Treatment Scale (SATS). The mean SATS scores improved by 2.3 points and 2.1 points for ACT and SC, respectively. The mean cumulative SATS ratings were higher by 0.45 points for ACT (p=ns) when compared with SC. ACT also resulted in greater improvement in adaptive functioning outcomes when measured using quality of life (QoL) scores and quality adjusted life years (QALYs). The mean QoL scores improved by 0.10 points and 0.04 points for ACT and SC, respectively (p=ns). The mean QALYs difference was 0.03 QALYs in favour of the ACT over 3 years (p=ns).

One US-based cost–consequences analysis [++][2] found that the integrated ACT (IACT) model resulted in significantly lower public sector costs when compared with ACT ($61,861 versus $85,798, p<0.05) over 24 months. The difference between IACT and SC of $5,532 was not statistically significant. Also, service users receiving IACT and ACT reported an improvement in acceptability of services. Service users were significantly more satisfied than service users in the SC group (p=0.03). There was no statistically significant difference in the acceptability of services (in terms of satisfaction levels) between IACT and ACT groups (p=0.12). Service users receiving IACT reported better adaptive functioning (in terms of stable housing days). The mean stable housing days were 57.67 for IACT, 55.61 for ACT, and 39.48 for SC. There were no statistically significant differences in mental health outcomes measured using Brief Psychiatric Rating Scale, and substance use outcomes measured using severity of alcohol and drug use, and number of days of substance use.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because both studies were conducted in the US and the Committee believed that the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. In 1 study QALYs were estimated; however, utility values were derived using non-validated measure that was developed by the authors specifically for this study. None of the studies considered other important outcomes including housing needs, employment, dependence on benefits, and levels of admissions to secure settings.

[1] Clark et al. (1998) [++]
[2] Morse et al. (2006) [++]

4.2 INTEGRATED TREATMENT

4.2.1 Judd et al., 2003

Aims and methods
Judd and colleagues (2003) evaluated the costs and outcomes of an integrated treatment delivered in the outpatient public mental health service in the US. Integrated treatment was defined as a simultaneous focus on both disorders through the provision of psychosocial rehabilitation, psychotherapeutic and psychopharmacologic treatment, and substance misuse recovery and relapse prevention by staff trained in the management of both disorders. The study population comprised adults with mental illness of depression, bipolar and psychotic illness who had a co-occurring substance disorder (alcohol, amphetamine, cannabis, opioid, sedative/anxiolytic, hallucinogen, or inhalant). The study was based on a before-after design. Clinical effectiveness data were obtained from the study participants (n=126). Resource use data were obtained from a subgroup of the study participants (n=81) and were supplemented with information from the state-wide criminal justice database, the California Alcohol and Drug Data System, and the California Department of Health Services databases. The perspective of the analysis was the public sector (health and social care and the criminal justice system). Costs consisted of criminal justice system costs, alcohol and drug treatment costs (day programme, outpatient visits, methadone maintenance and detoxification, and residential care), physical health costs (emergency services, hospitalisation, and outpatient services), mental health costs (inpatient care, emergency services, skilled nursing facility, and other treatment services. Local unit costs were used. Outcomes included the ASI-Lite, the Kennedy Axis V Subscales, the Behavior and Symptom Identification Scale (BASIS-32), the Center for Epidemiological Studies for Depression Scale (CES-D), the CA-QOL, the SF-12, the Pearlin Mastery Scale, the Rosenberg Self-Esteem Scale, and the BHRS, and the recovery status of service users as rated by the programme manager and care coordinators. The time horizon of the analysis was 3 years. Outcomes were reported at 3 years; costs were reported for 2 time periods: 2 years before and 2 years after implementation of the programme. Discounting was not applied on costs or outcomes.

Costs
According to the analysis, the mean public sector costs per person were $11,155 and $8,358 over 2 years before and 2 years after the programme entry, respectively; thus the cost reduction of $2,797 per person; the cost year was not reported but was probably in 2002 US dollars.

Outcomes – mental health
At 3 years, statistically significant improvements were observed on Kennedy Axis-V scale, the SF-12 Mental Health Scale, the BASIS-32 (psychosis, depression, anxiety, impulsive/addictive, and daily living skills scales).

Outcomes – substance use
At 3 years, according to the ratings by the programme manager and care coordinators 50% of the service users were sober, 34% were largely recovered with an occasional relapse, and 16% were still struggling with frequent relapses.

Outcomes – acceptability of services
Consumer satisfaction scores as measured on BHRS were consistently above the means for the normative programme scores. The results on CES-D and Pearlin Mastery scales were not reported.

Outcomes – adaptive functioning
At 3 years, statistically significant improvements were observed on Rosenburg Self-Esteem scale, CA- legal status domain on ASI, and QoL. At 3 years there was no change on the ASI, employment status, or service users' perceived health and medical status.

Conclusions
Based on the above findings integrated dual diagnosis treatment model resulted in the reduction of costs and also led to statistically significant improvements in psychiatric symptoms, substance misuse (as measured on the BASIS-32 impulsive/addictive scale) and QoL outcomes.

Applicability and limitations
The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by potentially serious methodological limitations including the measurement of costs over 2 years and outcomes over 3 years resulting in costs and outcomes being measured over different periods of time; the before-after study design; unit costs from local sources; and lack of discounting.

4.2.2 Lambert et al., 2002

Aims and methods
Lambert and colleagues (2002) evaluated the costs and outcomes of an integrated addiction treatment model with general psychiatric care in the US. Pre-programme introduction service users were referred to specialty stand-alone chemical addiction programmes. The study population comprised adults with post-traumatic stress disorder (PTSD), mood disorder, or schizophrenia, who had a co-occurring substance disorder.

The economic analysis was based on a before-after study. Clinical effectiveness and resource use data were obtained from the study participants. The number of participants was not reported. The perspective of the analysis was the healthcare payer. Costs consisted of general psychiatry, addiction treatment, and mental healthcare. The source of unit costs was unclear. The duration of the study was 1 year. The costs were reported for 1 year before and 1 year after programme entry. Outcomes included service user satisfaction (staff involvement and overall satisfaction) and staff feedback (access to addiction services, continuity of care and coordination of care). Service user satisfaction was also expressed using Z-scores. These were standardised scores found by dividing the difference between a particular monitor of interest at a site and the mean of all sites by the SD across all sites. Staff feedback was rated on an unspecified 5-point scale.

Costs
According to the analysis, the mean annual healthcare costs per person were $9,409 and $6,266 before and after programme entry, respectively; the cost difference was $3,143 per person, in favour of the integrated treatment programme.

Outcomes – acceptability of services
After implementation of the programme, service user satisfaction improved. Staff involvement was rated 0.50 versus 0.66 before and after the programme implementation, respectively. Overall satisfaction with care was rated 0.58 and 0.67 before and after the programme implementation, respectively. Satisfaction Z score improved from -0.43 to 0.6 in the site that implemented the programme (versus all other sites). Similarly, staff ratings showed an improvement. The ratings for access and addiction services improved from 3.1 to 4.1 before and after programme implementation, respectively; the ratings for continuity of care improved from 2.8 to 3.5; and the ratings for coordination of care improved from 2.6 to 3.7.

Conclusions
Based on the above the integrated treatment resulted in the reduction in costs and also an improvement in service user and staff satisfaction.

Applicability and limitations
The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US and adopted a narrow healthcare payer perspective. The analysis looked only at satisfaction levels with services and did not consider other important outcomes including QALYs, housing needs, employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by very serious methodological limitations including its short time horizon; before-after study design; unclear sample size and source of unit costs; and the measurement of satisfaction levels using non-validated tools. Due to very serious methodological limitations this study was not considered in the formulation of economic evidence statement.

Evidence statement 4.2: Integrated treatment compared with standard care (SC)

There was low-quality evidence on costs and consequences from 1 US study [+][1] comparing integrated treatment with SC.

The US-based cost–consequence analysis found that integrated treatment resulted in cost savings of $2,797 over 2 years after implementation of the programme. At 3 years, integrated treatment when compared with SC resulted in statistically significant improvements in mental health outcomes (Kennedy Axis V Scale; 12-item Short Form Health Status Questionnaire Mental Health Scale; Behavioural and Symptom Identification Scale-32 [BASIS-32] psychosis, depression, and anxiety domains); substance use outcomes (BASIS-32 Impulsive/Addictive domains); and adaptive functioning (Daily Living Skills domain on the BASIS-32; Rosenberg Self-Esteem Scale; California Quality of Life Inventory; and legal status). There was no significant change over time between intervention and SC in substance use outcomes when measured using Addiction Severity Index -Lite, adaptive functioning (in terms of employment status), or service users' perceived health or medical status. Acceptability of services (in terms of consumer satisfaction, measured on the

Behavioral Healthcare Rating of Satisfaction) was consistently above the means for the normative programme scores.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because the study was conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings.

[1] Judd et al. (2003) [+]

4.3 INTEGRATED TREATMENT BASED ON CASE MANAGEMENT – COST ANALYSIS

4.3.1 Jerrell (1996)

Aims and methods
Jerrell (1996) evaluated the costs of 3 specialised integrated treatments based on intensive case management, behavioural skills and SC, comprising AA/12-Steps, for the management of people with a dual diagnosis in the US. The intensive case management approach involved intensive assistance by a clinician or paraprofessional and services aimed at achieving sober living and social environments, and achieving and maintaining abstinence. Each service user received individualised case management services and psychoeducational group therapy on the effects of drugs and alcohol on psychiatric conditions, as well as psychiatric monitoring. The behavioural skills treatment relied extensively on CBT. SC was defined as an AA/12-Steps integrated treatment where clinical staff offered transitional or mock 'Alcoholic Anonymous (AA) meetings' groups within the mental health centre, took or referred service users to community AA meetings, and provided ongoing supportive counselling to help people manage the recovery process. In all treatment models, substance misuse services were delivered within mental health treatment teams or within their mental health agencies. In additional all service users received standard mental health services (medication and counselling). An update of the study was published by Jerrell & Hu (1996) adopting a wider public sector perspective (versus a healthcare payer perspective which was used in the original analysis). In another publication, Jerrell & Wilson (1996) reported subgroup analyses for black and minority ethnic groups and Jerrell & Ridgely (1995) looked at gender differences.

The population comprised adults with a dual diagnosis. Severe mental illness included psychotic or major affective disorder. Substances misused were not specified. The economic analysis was based on an RCT. Resource use data were obtained from the study participants (n=39 AA/12-Steps group, n=48 behavioural skills group, and n=45 case management group). The perspective of the analysis was the public sector (health and social care and the criminal justice system) and informal care. Costs consisted of public and private mental health sector services (inpatient care, emergency department visits, nursing, and residential treatment),

general medical healthcare (inpatient care, outpatient visits, and emergency department visits, as well as nursing home care), criminal justice system (police contacts, arrests, court appearances, attorney services, jail, probation, and conservator services), social service agencies, out-of-pocket expenses of service users and their families (expenditures for treatment, transportation, legal services), informal care costs (the time family members spent with the person in treatment and transportation), and transfer payments. Resource use data were taken from the RCT, supplemented with information from billing and claims data, criminal justice data systems, and other local sources. Local unit costs were derived from mental health authorities' management information, billing and claims information, county department cost accounting data, and other local sources. The time horizon of the analysis was 18 months. Costs were reported at baseline and at 6, 12 and 18 months post-study entry. No discounting was applied.

Costs

According to the analysis, the mean costs per person (and percent change in costs compared with baseline) for AA/12-Steps group were $19,888 at baseline, and $12,628 (-37%), $11,522 (-42%), and $12,585 (-37%) at 6, 12 and 18 months post-study entry, respectively (1990/1991 US dollars). For the behavioural skills group the respective costs per person were $12,252 (baseline), $9,509 (-22%), $10,149 (-17%), and $10,245 (-16%); and for the case management group the respective costs were $15,774 (baseline), $14,158 (-10%), $10,637 (-33%), and $9,364 (-41%). Based on the above findings the authors concluded that overall integrated AA/12-Step treatment demonstrated greatest cost savings. However, it has to be noted that even though AA/12-Step treatment demonstrated greatest cost savings, it did not have the lowest costs.

Applicability and limitations

The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by potentially serious methodological limitations including a relatively short time horizon; small sample sizes; resource use data were taken from the RCT , billing and claims data, criminal justice systems, and other local sources; the unit costs of resources were from local sources; and no statistical analysis was conducted.

Evidence statement 4.3: Integrated treatments based on case management, Alcoholic Anonymous (AA)/12-Steps, and behavioural skills compared with standard care (SC)

There was low-quality evidence from 1 US study [+][1] comparing costs associated with integrated treatments based on case management, AA/12-Steps, and behavioural skills with SC.

The US-based cost analysis [+][1] found that integrated case management treatment resulted in a greater public sector cost reduction over 18 months when compared with both integrated behavioural skills and integrated AA/12-Steps treatments. The integrated case management treatment resulted in a reduction of 41% in public sector costs, the integrated behavioural skills treatment resulted in a reduction of

16%, and the integrated AA/12-Steps treatment resulted in a reduction of 37% when compared with SC. It was unclear whether these cost reductions were statistically significant.

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because the study was conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. The study hasn't considered consequences.

[1] Jerrell. (1996) [+]

4.4 INTEGRATED TREATMENT BASED ON CASE MANAGEMENT – COST-EFFECTIVENESS ANALYSES

4.4.1 Jerrell & Ridgely (1999)

Aims and methods
In another study Jerrell & Ridgely (1999) evaluated the cost effectiveness of 3 specialised integrated treatments based on intensive case management, behavioural skills, and AA/12-Steps for the management of people with a dual diagnosis in US. Severe mental illness included psychotic or major affective disorder. Substances misused were not specified. SC was defined as AA/12-Steps integrated treatment. In all cases substance misuse services were delivered within mental health treatment teams or within their mental health agencies. All service users received standard mental health services (such as medication and counselling). The economic analysis was undertaken alongside an RCT. The study sample consisted of 132 adults. The time horizon of the economic analysis was 24 months, and its perspective was public sector, including healthcare and social care costs. Cost elements comprised case management, outpatient visits, medication visits, supported housing, day service, inpatient days, skilled nursing, residential treatment, and emergency department visits. Resource use data were obtained from the trial (n=132). The source of unit costs was unclear. The primary measures of outcome utilised in the economic analysis were the total SAS-II score and the RFS score of service users. Discounting was not applied.

In the integrated AA/12-Steps treatment, the degree to which staff actively engaged in teaching service users the 12-step recovery approach, in linking them to existing AA meetings in the community, and in recruiting and orienting AA sponsors were considered to be `core elements' and service users receiving these elements were considered as receiving `robustly implemented' services. In the integrated behavioural skills treatment, the degree to which staff actively used the structured treatment model and its skill-building framework to promote relapse prevention and problem solving among service users were considered the `core elements' and service users receiving these elements were considered as receiving `robustly implemented' services. In the integrated case management treatment, use of a team approach, psychoeducational groups regarding substance misuse, and psychiatric

monitoring consonant with the case management plan around substance misuse issues were considered `core elements' and service users receiving these elements were considered as receiving `robustly implemented' services. The results were reported for the robust and non-robust service implementation.

Costs
According to the analysis, the mean per-person costs associated with the robust service implementation were $11,752, $9,665, $6,375 for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively; the cost year was not reported but was probably 1998 US dollars. The mean per-person costs associated with the non-robust service implementation were $6,687, $5,529, and $7,334 for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively.

Outcomes – adaptive functioning
In terms of effectiveness the total SAS-II scores associated with the robust service implementation were 74.22 (SD 8.23), 77.03 (SD 10.67), 77.44 (SD 9.08) for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively. Similarly, the total SAS-II scores associated with the non-robust service implementation were 75.05 (SD 11.22), 76.10 (SD 7.48), 75.11 (SD 9.37) for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively.

The total RFS scores associated with the robust service implementation were 11.09 (SD 3.55), 13.30 (SD 4.20), 12.84 (SD 4.84) for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively. The total RFS scores associated with the non-robust service implementation were 13.52 (SD 3.60), 11.59 (SD 2.76), 11.46 (SD 4.03) for AA/12-Steps, behavioural skills, and case management integrated treatment, respectively.

Conclusions
Based on the robust service implementation costs and SAS-II as an outcome measure, the case management integrated treatment dominated the behavioural skills and AA/12-Steps integrated treatments (that is, case management integrated treatment was associated with lower public sector costs and higher total SAS-II score at 24-month follow-up). When using RFS as an outcome measure AA/12-Steps integrated treatment was dominated by case management and behavioural skills integrated treatment (that is, AA/12-Steps integrated treatment was associated with higher public sector costs and lower total RFS score at 24-month follow-up). The behavioural skills integrated treatment compared with the case management integrated treatment resulted in an ICER of $7,152 per additional point improvement on the RFS scale.

Based on the non-robust service implementation costs and outcomes the behavioural skills integrated treatment was dominant when using SAS-II as an outcome measure since it resulted in lowest public sector costs and also in the highest total SAS-II score at 24-month follow-up. When using RFS as an outcome measure the integrated case management treatment was dominated by AA/12-Steps and behavioural skills integrated treatments. The AA/12-Steps integrated treatment resulted in an ICER of $600 per additional point improvement on RFS when compared with the behavioural skills integrated model.

Applicability and limitations
The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings. The study was characterised by potentially serious methodological limitations including its short time horizon; small sample sizes; baseline outcomes were from an RCT; some of the estimates of resource use and the unit costs were from local sources.

4.4.2 Jerrell et al., 2000

Aims and methods
Jerrell and colleagues (2000) conducted a cost-consequences analysis to assess the impact of an integrated dual diagnosis day-treatment with clinical staff from both mental health, and drug and alcohol services in the US. The programme included skill-building groups for mental health problems and achieving or maintaining sobriety, 12-Steps groups and meetings, relapse prevention skills sessions, and case management. SC was not defined; however, it is believed that services were not integrated in any way.

The study population consisted of adults with a dual diagnosis. Severe mental illness included schizophrenia, bipolar disorder, or major depression with psychotic features. Substances misused were not specified. The economic analysis was based on a before-after study (n=118). Clinical effectiveness and resource use data were obtained from the study participants (n=59). Resource use and associated costs were also reported for dropouts (n=59). Resource use data were supplemented with information from local authority databases, billing system, and other local sources. The analysis adopted a public sector perspective (healthcare and social care); costs consisted of: mental health (healthcare and social care), and alcohol services. Costs were reported at 6 months before and 6 and 12 months after implementation of the programme. Unit costs were based on local sources. The effectiveness measures included: changes on the SAS; the RFS; the CUAD; the SLS; the CSQ-8; and an improvement in symptoms as measured using the DIS. The costs were reported separately for completers and for dropouts.

Costs
According to the study findings, the mean public sector per-person costs for completers were $5,004 (SD $4,689) at 6 months before programme implementation, $2,174 (SD $1,303) and $2,793 (SD $2,210) at 6 and 12 months after programme implementation, respectively; the cost year was not reported but was probably 1999 US dollars. Similarly, the mean public sector per-person costs for dropouts were $3,954 (SD $4,894) over 6 months before programme implementation, $1,730 (SD $1,532) and $995 (SD $1,075) at 6 and 12 months after implementation of the programme, respectively.

Outcomes – mental health
There was an improvement in depression symptoms (assessed using DIS), with scores of 8.71, 6.23 and 7.08 at 6 months before and 6 and 12 months after implementation of the programme, respectively; mania symptoms, with scores 3.92,

2.86 and 3.38; and schizophrenia symptoms, with scores 5.38, 5.00 and 5.77. However, none of the changes on DIS were statistically significant.

Outcomes – substance use
There was an improvement on the CUAD. On the cannabis severity domain the scores were 1.83, 0.59 and 0.00 at 6 months before and 6 and 12 months after programme implementation, respectively. Similarly there was an improvement on the cocaine severity domain, with scores 2.04, 1.00 and 1.85. However, none of the changes were statistically significant.

Outcomes – adaptive functioning
The integrated treatment resulted in an improvement on the SAS housing stability domain. The total scores were 5.08, 5.55 and 5.38 at 6 months before and 6 and 12 months after (non-significant change) implementation of the programme, respectively. Similarly, there was an improvement on the social contacts domain of SAS. The total scores were 19.12, 20.55, and 20.50 (non-significant change). There was an improvement on the family relations domain too, with scores 18.13, 19.80, and 19.69 ($p \leq 0.05$). There was an improvement in the work affect domain, with scores 20.29, 20.45 and 20.73 (non-significant changes). There was also an improvement on RFS, with scores 2.00, 2.46 and 2.65 ($p \leq 0.01$). There were no differences on SLS and CSQ-8.

Conclusions
Based on the above it could be concluded that the integrated treatment is dominant when compared with SC (that is, it resulted in lower costs and better outcomes); however, statistically significant changes were only observed on the SAS family relations and global functioning domains.

Applicability and limitations
The study is only partially applicable to the UK and NICE decision-making context. The study was conducted in the US and adopted a narrow public sector perspective that included only healthcare and social care costs. No QALYs were estimated nor did the study consider other important outcomes such as employment, dependence on benefits, and levels of admissions to secure settings. The study was characterised by potentially serious methodological limitations, including a short time horizon; small sample sizes; a before-after study design; unit costs of resources from local sources; and only some statistical analyses conducted.

Evidence statement 4.4: Integrated treatments based on case management, Alcoholic Anonymous (AA)/12-Steps, and behavioural skills compared with each other, or with standard care (SC)

There was low-quality evidence on costs and consequences from 2 US studies (2[+][1,2]) comparing integrated treatments based on case management, AA/12-Steps, and behavioural skills with each other, or with SC.

One US-based cost-effectiveness analysis [+][1] found that the integrated case management treatment resulted in lower per-person public sector costs and greater improvement in adaptive functioning when measured on the Social Adjustment Scale-II (SAS-II) and the Role Functioning Scale (RFS) over 24 months when compared with both integrated behavioural skills and integrated AA/12-Steps

treatments. The public sector cost over 24 months associated with the integrated case management treatment was $6,375, with the integrated behavioural skills treatment was $9,665, and with the integrated AA/12-Steps treatment was $11,752. The total SAS-II scores were 77.44 for the integrated case management treatment, 77.03 for the integrated behavioural skills treatment, and 74.22 for the integrated AA/12-Steps treatment. When using SAS-II as an outcome measure the integrated case management treatment was dominant (that is, it resulted in lower costs and better SAS-II scores). The RFS scores were 11.46 for the integrated case management treatment, 13.30 for the integrated behavioural skills treatment, and 11.09 for the integrated AA/12-Steps treatment. When using the RFS as an outcome measure the integrated AA/12-Steps treatment was dominated by both integrated case management and integrated behavioural skills treatment (that is, the integrated case management treatment resulted in higher costs and lower scores on the RFS scale). The integrated behavioural skills treatment (when compared with the case management treatment) resulted in an incremental cost-effectiveness ratio of $7,152 per additional point improvement on the RFS scale. It was unclear whether costs and outcomes were statistically different between treatments.

One US-based cost–consequences analysis [+][2] found that the integrated case management treatment resulted in public sector cost savings at 6 and 12 months after implementation of the programme compared with SC services that were provided before the implementation of integrated treatment. At 6 months after implementation of the programme the cost savings for the integrated case management amounted to $2,830 and at 12 months to $2,211. Using integrated case management treatment compared with SC services resulted in an improvement in adaptive functioning when measured on the Social Adjustment Scale (SAS) family relations domain of 1.67 and 1.56 at 6 and 12 months, respectively ($p \leq 0.05$). Using integrated case management treatment compared with SC services also resulted in an improvement in adaptive functioning when measured on the RFS scale of 0.46 and 0.65 points at 6 and 12 months, respectively ($p \leq 0.01$). There was no change over time in adaptive functioning when measured on the SAS (housing stability, social contacts and work affect domains); mental health outcomes (Diagnostic Interview Schedule); substance use outcomes (Chemical Use, Abuse, and Dependency Scale); and acceptability of services (Satisfaction with Life Scale and Client Satisfaction Questionnaire-8).

Applicability to the UK and NICE decision-making context:

This evidence is only partially applicable to the UK and NICE decision-making context. This is because both studies were conducted in the US and the provision of interventions is likely to differ from that in the UK, which has better co-ordinated services for severe mental illness than the US. No QALYs were estimated nor did the study consider other important outcomes such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings. Also, 1 of the studies adopted a narrow public sector perspective.

[1] Jerrell & Ridgely. (1999) [+]
[2] Jerrell et al. (2000) [+]

4.5 OTHER INTERVENTIONS

4.5.1 Craig et al., 2008

Aims and methods
Craig and colleagues (2008) evaluated the cost effectiveness of a 5-day training course in assessment and management (including the provision of integrated treatment) of service users with a dual diagnosis in England (South London). The study population comprised adults with schizophrenia, schizoaffective disorder or other non-affective psychotic illness or bipolar affective disorder with psychotic symptoms, plus a substance misuse problem. Substances misused included alcohol and/or cannabis, stimulants, and other non-specified drugs.

The integrated treatment was defined as a combination of motivational interviewing targeted at the substance misuse problem and cognitive behavioural strategies targeted at mental health problems delivered by case managers trained in the assessment and management of co-occurring disorders. SC was no training intervention and comprised conventional management by CMHTs. The management of substance misuse was by referral to a separate substance dependency service as there was no substance misuse specialist on the teams.

The economic analysis was conducted alongside a cluster RCT (Johnson 2007). Effectiveness data were obtained from the study participants (n=228 at baseline; n=206 at 18-month follow-up). The resource use estimates were based on 212 study participants. The analysis adopted a public sector perspective (including health and social care and the criminal justice system). Costs consisted of healthcare and social care costs (psychiatrist, other specialist, community nurse, social worker, psychologist, drug and alcohol worker, counsellor, day care, general practitioner, and medication), and criminal justice system costs (court, police and prison). National UK unit costs were used. The outcome measures included: the BPRS, the CANSAS, the LSP, the MANSA, the CSQ, the TPQ, the Maudsley Addiction Profile (MAP), the Alcohol Use Disorders Identification Test (AUDIT), the Dartmouth Assessment of Lifestyle Instrument (DALI). Alcohol consumption (units per day) were measured; and also data on amounts consumed of cannabis and other drugs were collected and converted to a total monetary value on the basis of current street values of each drug in South London.

The time horizon of the analysis was 18 months. Discounting was not applied. Differences in outcomes were adjusted for differences in baseline scores between the groups.

Costs
Over 18 months, the intervention was more costly than SC, although no statistical significance in cost differences was reached. The mean public sector cost per person was £18,672 (SD £26,449) versus £17,639 (SD £23,266) for the intervention and SC group, respectively; the cost year was not reported but was probably 2007. The intervention resulted in a higher cost (the difference of £1,033 per person; bootstrapped 95% confidence interval [CI]: –£5,568 to £6,734). However, this difference was not statistically significant.

Differences between the 2 groups in cannabis use were not statistically significant. Monthly costs for drugs other than cannabis fell from £144 (SD £1,023) to £33 (SD £154 in the intervention group and rose from £110 (SD £333) to £124 (SD £470) in the SC group, but these differences between groups in monthly costs were not statistically significant.

Outcomes – mental health
At 18-month follow-up the mean BPRS score was 37.0 (SD 9.8) and 41.6 (SD 11.2), for the intervention and SC group, respectively. The intervention resulted in a reduction of 4.2 points (95% CI: -7.3 to -1.2, p<0.001) on the BPRS. At 18 months the mean CANSAS scores were 6.8 (SD 3.4) and 7.5 (SD 3.1) for the intervention and SC group, respectively. The intervention resulted in the reduction of 0.84 points (95% CI: -1.6 to -0.04, p=0.04).

Outcomes – substance use
Alcohol consumption fell from a mean of 4.8 (SD 7.2) units a day at baseline to 3.5 (SD 5.6) units a day at follow-up in the intervention group; the reduction of 1.3 units a day. In the SC group alcohol consumption fell from a mean of 7.2 (SD 6.6) to 4.4 (SD 7.4) units a day; the reduction of 2.2 units a day. However, the reductions in alcohol use were not statistically significant.

The results on MAP, DALI or AUDIT scales were not reported.

Outcomes – acceptability of services
On the CSQ at 18-month follow-up the mean scores were 23.5 (SD 6.5) and 23.4 (SD 6.3). The intervention resulted in the reduction of service user satisfaction of 0.99 points (95% CI: -3.3 to 1.3, p=0.39). On the TPQ at 18-month follow-up the mean scores were 21.5 (SD 0.8) and 21.1 (SD 0.75). The intervention resulted in an improvement of 0.68 points (95% CI: -2.1 to 3.5, p=0.62).

Outcomes – adaptive functioning
On the LSP at 18-month follow-up the mean scores were 121.0 (SD 16.3) and 120.5 (SD 15.8). The intervention resulted in an improvement of 1.31 points (95% CI: -2.4 to 4.9, p=0.49). On the MANSA scale at the 18-month follow-up the mean scores were 53.4 (SD 12.1) and 50.0 (SD 12.8) for the intervention and SC, respectively. The intervention resulted in an increase of 0.62 points (95% CI: -3.8 to 2.9, p=0.79).

Conclusions
Overall the staff training intervention did not have a statistically significant impact on the substance misuse. However, there was a modest effect on the co-occurring psychiatric disorders as measured on the BPRS. Based on the above findings, compared with SC, the intervention resulted in an ICER of £246 per additional point improvement on the BPRS; £1,230 per additional point improvement on the CANSAS; £789 per additional point improvement on the LSP; £1,666 per additional point improvement on the MANSA; and £1,519 per additional point improvement on the TPQ. SC was dominant using the CSQ as an outcome measure (that is, SC resulted in lower cost and better outcome).

Applicability and limitations
The study is directly applicable to the UK and NICE decision-making context. The study was conducted in the UK and adopted the public sector perspective. However, no QALYs were estimated nor were other important outcomes considered, such as housing needs, employment, dependence on benefits, and levels of admissions to secure settings. This study was characterised by minor methodological limitations including a relatively short time horizon; the estimates of baseline outcomes and the estimates of resource use were from an RCT.

Evidence statement 4.5: Staff training versus standard care (SC)

There was moderate-quality modelling evidence on cost effectiveness from 1 UK study [++][1] comparing a staff training intervention with SC.

The UK-based cost-effectiveness analysis found that the staff training intervention resulted in an increase of £1,033 in public sector costs when compared with SC over 18 months. The staff training intervention also resulted in an improvement in mental health outcomes measured on the Brief Psychiatric Rating Scale (BPRS) (improvement of 4.2 points, ($p<0.001$)) and on the Camberwell Assessment of Need Short Assessment Schedule (CANSAS) (improvement of 0.84 points, ($p=0.04$)).There was also an improvement in adaptive functioning when measured on the Life Skills Profile (LSP) (improvement of 1.31 points, ($p=0.49$)) and on the Manchester Short Assessment of Quality of Life (MANSA) scales (improvement of 0.62 points, ($p=0.79$)). There was worsening in acceptability of services when measured on the Client Satisfaction Questionnaire (CSQ); worsening of 0.99 points ($p=0.79$). However, there was an improvement in acceptability of services when measured on the Treatment Perceptions Questionnaire (TPQ); an improvement of 0.68 points ($p=0.62$). Based on the above costs and outcomes, the staff training intervention resulted in incremental cost-effectiveness ratios of: £246 per additional point of improvement on the BPRS; £1,230 per additional point of improvement on the CANSAS; £789 per additional point of improvement on the LSP; £1,666 per additional point of improvement on the MANSA; and £1,519 per additional point of improvement on the TPQ. SC was dominant when using the CSQ as an outcome measure (SC resulted in lower cost and better outcome).

No economic evidence on other complex interventions such as brokerage case management, contingency management, time-limited care coordination, shelter-based psychiatric clinics, supportive housing, and supportive text messaging used in the management of people with a dual diagnosis is available.

Applicability to the UK and NICE decision-making context:

The study is directly applicable to the UK and NICE decision-making context. The study was conducted in the UK and adopted the public sector perspective.

[1] Craig et al. (2008) [++]

4.6 DISCUSSION OF FINDINGS – EXISTING ECONOMIC EVIDENCE

Overall, there was little evidence to support any service delivery model over another, based on existing economic evidence. Based on evidence from 1 UK and 7 US studies, integrated treatment appears to result in minor cost savings when compared with usual care and also result in an improvement in some outcomes. However, the findings were inconsistent. This is in line with effectiveness review 3 which found no evidence of benefit of integrated treatment compare with usual care for mental health, substance misuse, housing, employment or QoL outcomes.

The majority of the studies in this review were undertaken in the US where service configuration for people with a dual diagnosis is very different from that of the UK. The perspectives of the studies varied considerably. Some of the studies adopted wide public sector perspectives comprising healthcare, social care and the criminal justice system costs and outcomes. Some studies also included informal care. Other studies limited their perspectives to healthcare and social care, or healthcare only.

Out of 8 included studies, 5 economic analyses were conducted alongside RCTs and the remaining 3 were before-after studies. The time horizon of the economic analyses varied from 1 to 3 years which is not sufficiently long to reflect all important differences in costs and outcomes. Some of the studies used different time horizons for costs and outcomes. Economic analyses utilised different outcome measures. Furthermore, clinical outcomes were reported as changes on various scales. Such information has limited use to inform healthcare decision-makers as is it unclear how these measured changes in scales map onto mediating factors, generic and mental health outcomes, or measures of HRQoL. This also made it difficult to judge the cost effectiveness of service delivery models (for example, does £1,230 per additional point improvement on the CANSAS represent value for money?). The majority of studies did not attempt to combine costs and outcomes at all. The type of costs included and the sources of cost data varied greatly. In some cases unit cost data were obtained from local sources or the source was unclear. Only 1 study undertook sensitivity analysis to explore uncertainties in results.

Only 1 included economic study was judged to be directly applicable to the UK and NICE decision-making context. Three studies were judged to be characterised by minor methodological limitations, 4 studies by potentially serious methodological limitations, and 1 study by very serious methodological limitations.

5 ECONOMIC MODELLING - METHODS

5.1 OBJECTIVE

The systematic review and meta-analysis of clinical evidence for review question 3 failed to identify convincing evidence for the effectiveness of service delivery models focused on delivering care for people with a dual diagnosis. Given the lack of convincing clinical evidence for the effectiveness of service delivery models a cost analysis, examining the impact of a hypothetical treatment engagement intervention to improve engagement with SC services for people with a dual diagnosis living in the community, was undertaken. The cost analysis assessed whether the costs of providing the treatment engagement intervention would be offset by future cost savings resulting from reduced hospital admissions.

5.2 METHODS

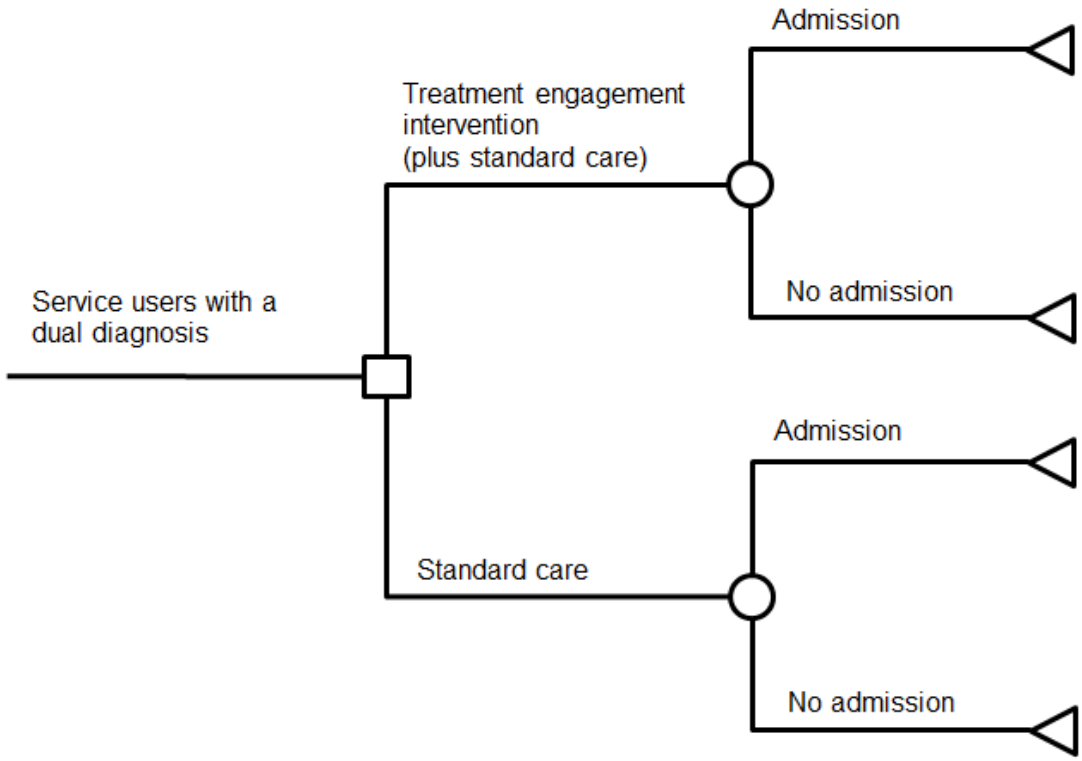
5.2.1 Intervention examined

A hypothetical treatment engagement intervention to improve engagement with SC services was modelled on the description of an integrated treatment adherence programme for people with bipolar disorder and substance misuse by Wenze and colleagues (2015) in the US, identified in the systematic review of clinical evidence. This treatment adherence programme was delivered over 6 months and included face-to-face individual sessions, individual phone sessions, and phone sessions with significant others. It also included face-to-face family sessions and brief face-to-face 'check-in' sessions. However, following discussions with the experts, family sessions and 'check-in' sessions were excluded because more often than not service users with a dual diagnosis do not have contact with their families. Also, 'check-in' sessions are usually provided as part of the SC services by the CMHTs.

5.2.2 Model structure

A simple decision-tree was constructed using Microsoft Excel 2013 to estimate the costs of the treatment engagement intervention for service users with a dual diagnosis. According to the model structure, hypothetical cohorts of service users with a dual diagnosis received either the treatment engagement intervention plus SC services or they received only SC services. During the duration of the model, service users with a dual diagnosis receiving either intervention or SC could relapse and consequently would require hospital inpatient treatment. A 1-year time horizon was chosen because relapse rates were available for 12-month follow-up. A schematic diagram of the decision-tree is presented in Figure 2.

Figure 2. Schematic diagram of the structure of the economic model.



5.2.3 Costs considered in the analysis

People with a dual diagnosis who are not engaged with services are likely to incur substantial costs to health and social care services and the criminal justice system. NICE recommends that economic analyses of interventions with health and non−health outcomes in public sector settings adopt a public sector perspective *Developing NICE Guidelines: The Manual* (NICE, 2014). However, due to the lack of relevant cost data (from the literature review) the analysis adopted a narrow NHS and personal social services (PPS) perspective, and considered only intervention and hospital admission costs. The exclusion of wider public sector and societal costs is acknowledged as a potentially serious limitation of the economic analysis. SC costs were excluded from the analysis as these were common to both arms of the model.

5.2.4 Model input parameters

Clinical efficacy of a hypothetical treatment engagement intervention, baseline admission rates and the duration of admission data

There is no efficacy data on people with a dual diagnosis who receive a treatment engagement intervention. Wenze and colleagues (2015) compared an integrated treatment adherence programme (n=14) with an active control defined as enhanced assessment and monitoring (n=16). However, the authors could not calculate the effect sizes with the data available, and the results were only described. In the base-case analysis it was assumed that a treatment engagement intervention would reduce hospital admissions by 10%. This assumption was validated by the Committee, and is varied in sensitivity analysis.

The baseline admission rate for service users with a dual diagnosis was approximated by relapse rates reported in 2 UK-based studies identified in the systematic reviews of clinical evidence (Barrowclough et al; 2001; Barrowclough et al., 2010). The underlying assumption (agreed by the Committee) was that all relapses would eventually require hospital inpatient treatment. Barrowclough and colleagues (2001) conducted an RCT (n=36) of motivational interviewing, CBT and family intervention for service users with schizophrenia and substance misuse. SC was defined as routine care in the context of the English NHS consisting of psychiatric management by the clinical team, coordinated through case management and including maintenance neuroleptic medication, monitoring through outpatient and community follow-up, and access to community-based rehabilitative activities, such as day centres and drop-in clinics. A relapse was defined as a hospital admission or an exacerbation of symptoms lasting for 2 or more weeks. The relapse rate was reported at 12-month follow-up. Similarly, a study by Barrowclough and colleagues (2010) was an RCT (n=327) of integrated motivational interviewing and CBT for people with psychosis and comorbid substance misuse. SC comprised antipsychotic medication, outpatient and community follow-up, and access to community-based rehabilitative activities. A relapse was defined as an exacerbation of symptoms lasting for 2 or more weeks. The relapse rate was reported at 24-month follow-up.

The baseline admission rates were approximated using relapse rates reported in the SC arms of the above RCTs. The 2-year relapse rate reported by Barrowclough and colleagues (2010) was annualised and transformed into a 1-year probability of the relapse. Similarly, the rate reported by Barrowclough and colleagues (2001) was transformed into a 1-year probability of the relapse. A weighted average of the 2 relapse probabilities was used to approximate a 1-year probability of the hospital admission associated with SC services. The study sample size was used as a weight in a weighted average calculation.

The duration of hospital admission was approximated using the duration of relapse data reported by Barrowclough and colleagues (2010).

5.2.5 Intervention costs (costs of providing a treatment engagement intervention)

In order to calculate total intervention costs, relevant resource use was estimated and combined with respective unit costs. Resource use estimates were based on information provided in the study by Wenze and colleagues (2015). The treatment engagement intervention was delivered over 6 months and included an average of 2.71 (SD 0.73) face-to-face individual sessions, 9.50 (SD 4.67) individual phone sessions, and an average of 4.07 (SD 4.58) phone sessions. Face-to-face individual sessions each lasted 1 hour and phone sessions each lasted 15 minutes.

The unit cost of therapists providing the treatment engagement intervention was estimated to be similar to the unit cost of CMHT practitioners, which has been estimated at £37 per hour per team member in 2013/14 prices (Curtis, 2014). This estimate was based on mean basic salaries for Agenda for Change bands and was weighted to reflect input of community nurses (31%), social workers/approved social

workers (18%), consultants (6%), occupational therapists and physiotherapists (5%), carer support (5%) and others. Weighted average salaries for each type of worker were multiplied by the proportion of that type of worker in the team to produce a generic CMHT practitioner salary. It includes salary, salary on costs, overheads, management and other non-care staff costs, and capital overheads, but does not take into account qualification costs because the latter are not available for all care staff.

Based on the above resource use estimates and the unit cost of CMHT practitioners, the cost of providing the treatment engagement intervention was estimated at £226 per service user (for the 6-month intervention) with a dual diagnosis in 2013/14 prices.

Costs of admission

In order to estimate the costs of admission, the duration of admission and the unit cost per day of hospital admission are needed. Data on the duration of admission was approximated by the duration of mean relapse reported in the study by Barrowclough and colleagues (2010). According to the study, the mean days spent in relapse at 12-month follow-up were 37.08 (SD 76.84) days. The unit cost of inpatient admission was estimated to be similar to that of inpatient detoxification for people who misuse drugs or alcohol. Such inpatient units provide care to service users with substance-related problems (medical, psychological or social) that are so severe that they require medical, psychiatric and psychological care. The key feature of such units is the provision of these services with 24-hour cover, 7 days per week, from a multidisciplinary clinical team who have had specialist training in managing addictive behaviours. The 3 main settings for inpatient treatment are: (1) general hospital psychiatric units; (2) specialist drug misuse inpatient units in hospitals; and (3) residential rehabilitation units (usually as a precursor to the rehabilitation programme). The national unit cost has been estimated at £152 per patient day in 2013/14 prices (Curtis, 2014). This estimate includes: salaries plus oncosts for care staff; direct overheads (such as drugs, pharmacy and dispensing costs, treatment materials, toxicology and drug testing, medical supplies, rent and rates, staff travel, training, service user travel costs, volunteer expenses, contingency management, office costs specifically attributed to the provision of the service and non-pay administration [for example, telephones and information technology]); and indirect costs and overheads (such as capital charges, expenditure on refurbishment, property and buildings, housekeeping, catering, porterage, transport, waste disposal, security, finance, human resources, personnel, communications and corporate charges). Based on the above duration data and the unit cost per inpatient day, the cost of hospital admission was estimated at £5,636 per service user with a dual diagnosis in 2013/14 prices.

Table 1 presents the values of clinical input parameters as well as the cost data that were used to populate the economic model.

Table 1. Input parameters utilised in the base-case analysis of the economic model of treatment engagement intervention for service users with a dual diagnosis

Input parameter	Value	Source of data – comments

Input parameter	Value	Source of data – comments
Clinical input parameters		
Annual probability of admission – SC	33%	Based on a 2-year probability of relapse of 67% in the SC arm in Barrowclough et al., 2001 and a 1-year probability of relapse of 38% in the SC arm in Barrowclough et al., 2010. Probabilities were annualised and a weighted average was calculated to derive an annual probability of relapse. An annual probability of relapse was used to approximate the annual probability of admission.
Efficacy – treatment engagement intervention	10%	Based on assumption.
Intervention cost per service user	£226	Resource use based on Wenze et al., 2015 and includes 2.7 face-to-face individual sessions each lasting 1 hour, 9.5 individual phone sessions each lasting 15 minutes and 4.1 phone sessions with significant others each lasting 15 minutes. It was assumed that sessions would be delivered by a CMHT practitioner. The unit cost of a CMHT practitioner was estimated to be £37 per hour per team member contact (PSSRU, 2014).
Admission cost per service user	£5,636	Based on the mean number of days in relapse of 37.1 reported in Barrowclough et al., 2010 and the unit cost of admission of £152 per day (PSSRU, 2014).

Sensitivity and threshold analyses

One- and 2-way sensitivity analyses were undertaken to explore the robustness of the results under the uncertainty characterising some model input parameters. The following parameters were tested in sensitivity analysis:

- intervention efficacy
- probability of relapse associated with SC
- relapse duration
- intervention cost
- relapse cost
- utility gain
- simultaneous change in the cost of relapse and efficacy.

Threshold analyses were conducted to identify model input parameter values at which the conclusions of a model might change.

The systematic review did not identify any quality of life inputs that could be used in a cost-utiltiy model. Instead, we estimated the required QALY difference per person between the intervention and SC for the treatment engagement intervention to be considered cost effective (that is, for the ICER to be below the NICE lower cost-effectiveness threshold of £20,000 per QALY [NICE, 2008]). This was estimated assuming that the QALY decrement applies only over the duration of admission.

The ICER is calculated using the following formula:

ICER = (cost of intervention – cost of SC)/(QALYs of intervention – QALYs of SC)

In this case the ICER expresses the additional cost per QALY gained associated with the provision of the treatment engagement intervention for people with a dual diagnosis.

5.2.6 Validation of the economic model

The economic model (including the conceptual model and the Excel spreadsheet) was developed by the health economist working on this project and checked by a second modeller not working on the project. The model was tested for logical consistency by setting input parameters to null and extreme values and examining whether results changed in the expected direction. The assumptions and the results were discussed with the Public Health Advisory Committee members to confirm their plausibility.

6 ECONOMIC MODELLING - RESULTS

6.1.1 Base-case analysis

The reduction in hospital admissions achieved by the provision of the treatment engagement intervention for service users with a dual diagnosis yielded a cost increase of £4,203 for a cohort of 100 service users or £42 per service user over the 1 year of the analysis. Providing the treatment engagement intervention incurs a cost of £226 per service user, assuming treatment efficacy of 10%. Full results of the base-case analysis are reported in Table 2.

Table 2. Results of the economic analysis of a treatment engagement intervention versus SC in people with a dual diagnosis – mean costs for 100 service users

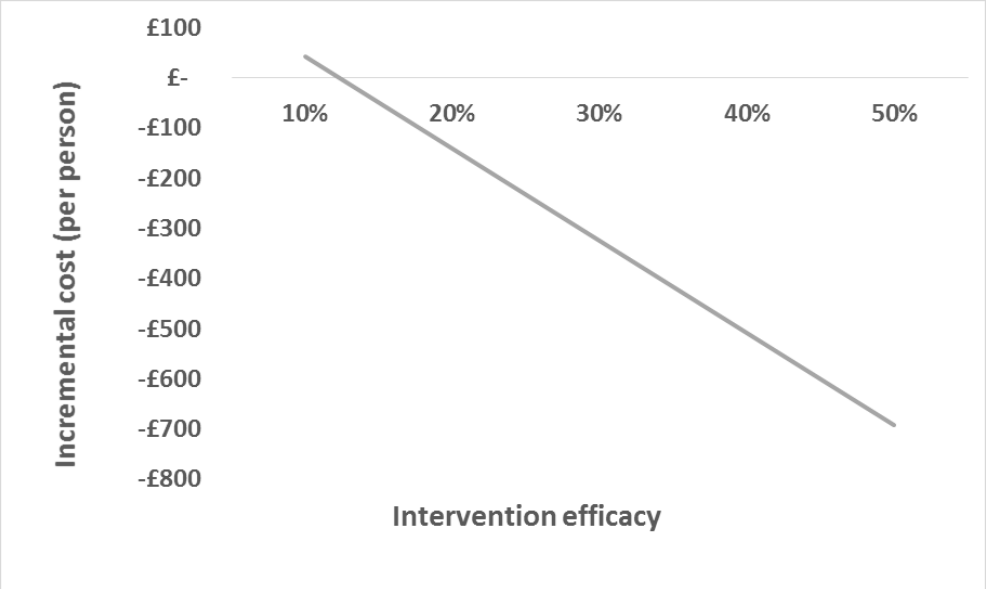
Intervention	Total intervention costs	Total admission costs	Total costs	Incremental cost (intervention versus SC)
Treatment engagement intervention	£22,579	£165,386	£187,965	£4,203 per cohort of 100 service users or £42 per service user
SC	-	£183,762	£183,762	

6.1.2 Sensitivity analysis

Results of the sensitivity analysis indicated that the incremental cost per service user with a dual diagnosis yielded is very sensitive to model input parameter values.

- As the efficacy of the intervention is varied from 10% to 50% (base-case value 10%) the incremental cost per service user ranges from £42 to -£693. The point at which the intervention becomes cost saving is 12%. The relationship between the efficacy of the intervention and the incremental cost per service user is summarised in Figure 3.
- As a 1-year probability of relapse associated with SC is varied from 10% to 50% (base-case value 33%) the incremental cost per service user ranges from £169 to -£56. The point at which the intervention becomes cost saving is 38%.
- As the duration of admission is varied from 10 to 50 days (base-case value 37.1 days) the incremental cost per service user ranges from £176 to -£22. The point at which the intervention becomes cost saving is 45.6 days.
- As the intervention cost per service user is varied from £50 to £400 (base-case value £226) the incremental cost per service user ranges from -£134 to £216. The point at which the intervention becomes cost saving is £184.
- As the cost of hospital admission per service user is varied from £1,000 to £8,000 (base-case value £5,636) the incremental cost per service user ranges from £193 to -£35. The point at which the intervention becomes cost saving is £6,542.

Figure 3. One-way sensitivity analysis showing the relationship between the efficacy of the intervention and the incremental cost per service user



A 2-way sensitivity analysis where efficacy and cost of admission per service user are varied simultaneously shows that there is a trade-off between efficacy and a cost of admission. For example, as the cost of admission per service user falls the efficacy has to increase for the intervention to be cost saving. Full results of the 2-way sensitivity analysis showing the relationship between the efficacy and the cost of admission per service user are presented in the Table 3.

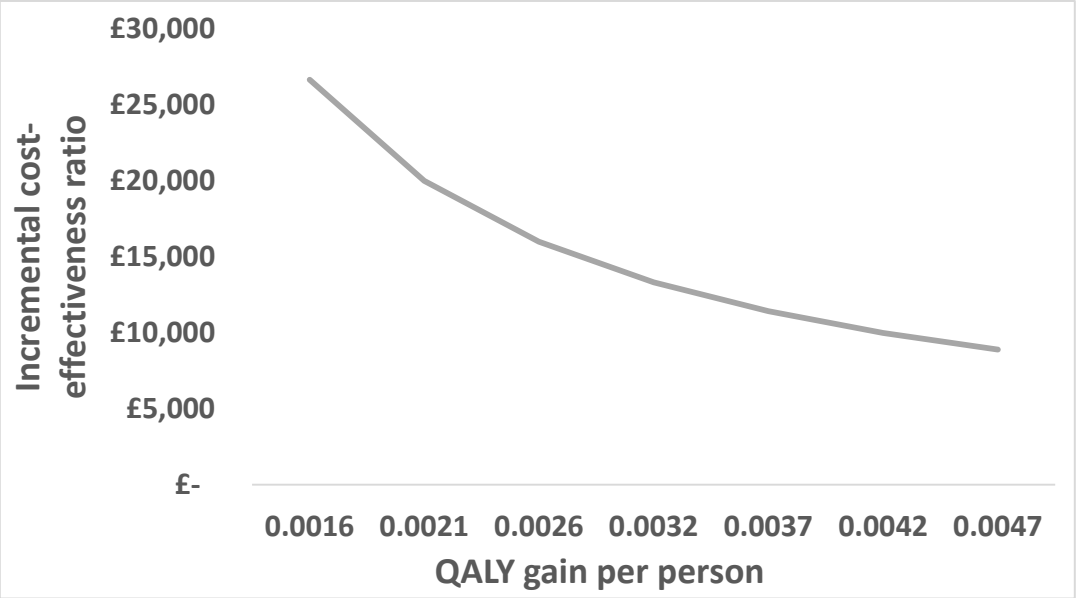
Table 3. Two-way sensitivity analysis showing how incremental cost per service user with a dual diagnosis varies when intervention efficacy and cost of admission (per service user) is varied simultaneously

		Intervention efficacy									
		10%		20%		30%		40%		50%	
Cost of admission (per person)	£1,000	£	193	£	161	£	128	£	95	£	63
	£2,000	£	161	£	95	£	30	-£	35	-£	100
	£3,000	£	128	£	30	-£	68	-£	165	-£	263
	£4,000	£	95	-£	35	-£	165	-£	296	-£	426
	£5,000	£	63	-£	100	-£	263	-£	426	-£	589
	£6,000	£	30	-£	165	-£	361	-£	557	-£	752
	£7,000	-£	2	-£	231	-£	459	-£	687	-£	915
	£8,000	-£	35	-£	296	-£	557	-£	818	-£	1,078

According to the threshold analysis, a difference of 0.002 in QALYs between the intervention and SC per service user would be required for the ICER of the treatment engagement intervention to be below the lower NICE cost-effectiveness threshold. According to the 1-way sensitivity analysis, as QALY gain per service user is varied from 0.0016 to 0.0047, the ICER ranges from £26,665 to £8,888. This indicates that very small changes in the QALY gain per service user (equivalent to 0.6 and 1.7

days in full health, respectively) would be required for the intervention to be cost effective. Figure 4 shows the relationship between QALY gain per service user and the ICER of the intervention.

Figure 4. Sensitivity analysis showing the relationship between QALY gain per service user and the ICER of the intervention



6.2 DISCUSSION OF FINDINGS – DE NOVO ECONOMIC MODELLING

The results of the economic model indicate that a treatment engagement intervention has the potential to be cost effective for people with a dual diagnosis.

The analysis is characterised by a number of limitations. Due to lack of available evidence, a number of the estimates used in the economic model were based on assumptions and single studies. The study population in Wenze and colleagues (2015) comprised a mix of people with bipolar disorder receiving inpatient care and those who were at risk (that is, outpatients), whereas the studies by Barrowclough and colleagues (2001; 2010) included people with schizophrenia who had been discharged from hospital into community care. In the UK, bipolar cases are treated in primary care but schizophrenia patients are treated by CMHTs. However, it is very likely that service users with both bipolar disorder and schizophrenia would be offered a similar level of additional engagement, and by the time they are offered the intervention they can be expected to be in the community where the costs of the engagement will be largely independent of where they had been treated at the time of enrolment.

The base-case analysis has assumed that the intervention would reduce admissions by 10%; however, if that rate was only slightly higher (that is, 12%) the intervention would be cost-saving. The critical assumption of a 10% reduction in relapses has little justification, but it provides a starting point for examining where the intervention becomes cost-saving, by varying different assumptions in turn.

According to the threshold analysis, a difference of 0.002 in QALY between the intervention and SC per service user would be required for the ICER of the treatment engagement intervention to be below the lower NICE cost-effectiveness threshold (£20,000 per QALY). The QALY gain required was conservatively estimated assuming that the utility difference will be observed only during the duration of admission. However, it is possible that changes in HRQoL could persist beyond the duration of the admission. In the long run, a relapse may have consequences on the person's life expectancy. It is also possible that there would be improvement not only to the substance-misuse problem but also to the mental health of service users, and consequently there will be an even greater QALY-gain associated with the intervention.

It is very likely that people with a dual diagnosis who are not engaged with services will incur substantial costs to health and social care services, and the criminal justice system. Initially, an economic analysis was attempted that tried to incorporate such costs. However, due to the data limitations, such modelling required too many unsubstantiated assumptions to be made pertaining to the potential engagement rates associated with: the intervention; relapse and admission rates; transitions between engaged, not engaged and relapse health states; costs associated with such health states; and so on. Moreover, a simple economic analysis indicated that under a plausible set of assumptions it is very likely that a treatment engagement intervention will be cost effective when considering only admission costs. Nevertheless, limiting the time horizon to 1 year, and the exclusion of important public sector and wider societal costs, is acknowledged as a limitation of this analysis and, as a result, the cost savings associated with the treatment engagement intervention have been underestimated. A change in each one of these factors will increase the probability that the intervention will be cost effective.

In all, the intervention described is likely to have a relatively small cost. It is unlikely that a conclusion of cost-effectiveness would apply to a situation which has a similar effect size but a far higher cost. This conclusion has been reached with a reasonable degree of confidence that additional and relatively-inexpensive efforts to engage service users will be cost effective and may also be cost saving, even over a very short time horizon.

Evidence statement 4.6: Treatment engagement intervention compared with standard care (SC) (an economic analysis conducted for this review)

There was low-quality evidence on costs from an economic analysis (threshold analysis) [+][1] conducted for this review comparing a treatment engagement intervention with SC services.

Evidence from the economic analysis (threshold analysis) [+] found that, when assuming an efficacy rate of 10%, the treatment engagement intervention would lead to an incremental cost of £42 per person over 1 year when compared with SC alone. However, when the efficacy rate is 12%, the intervention would become cost saving. Moreover, when assuming the efficacy rate of 10% and the difference of 0.002 in quality adjusted life years (QALYs) between the intervention and SC per person the incremental cost-effectiveness ratio of the intervention would be below the lower NICE cost-effectiveness threshold of £20,000 per QALY. The cost savings are likely

to be underestimated since the analysis has not considered wider health, social care, and public sector costs; and adopted a short time horizon.

Applicability to the UK and NICE decision-making context:

The economic analysis is directly applicable to the UK and NICE decision-making context. The analysis has adopted NHS and personal social services perspective; and estimated the required QALY gain for the intervention to be considered cost effective.

[1] Economic analysis conducted for this review [+]

7 OVERALL CONCLUSIONS

The review of existing economic evidence did not find convincing evidence for the cost effectiveness of any particular service configuration for people with a dual diagnosis. De novo economic modelling conducted for the review suggested that treatment engagement intervention may have the potential of being a cost-effective option for people with a dual diagnosis. Assuming standard care in the UK would need to be enhanced and thus require additional resources at a cost of £226 per individual and assuming an effect size of 10% the intervention would need to result in a small QALY gain of 0.002 (equivalent to 0.73 days in full health) for an ICER to be below the lower NICE cost-effectiveness threshold of £20,000. However, the analysis was characterised by potentially serious limitations including efficacy data based on assumptions, short time horizon, and exclusion of important public sector and wider societal costs.

8 REFERENCES

(See Appendix 5 for included studies bibliography)

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APPENDICES

APPENDIX 1 PROTOCOL FOR ECONOMIC REVIEW AND ECONOMIC ANALYSIS FOR RQ 4

Component	Description
Review question	Review question (RQ) 3: Which service models for health, social care and voluntary and community sector organisations are effective and efficient at meeting the needs of people with a dual diagnosis? A systematic review of the literature will be undertaken in order to identify: 1. Published economic evaluations that assess which service models for health, social care and voluntary and community sector organisations are cost-effective and efficient at meeting the needs of people with a dual diagnosis. 2. Studies reporting resource use and cost data associated with service delivery models that could be utilised in primary economic modelling. 3. Utility studies that provide data on the health-related quality of life (HRQoL) of people with dual diagnosis that can be used in the estimation of quality-adjusted life years (QALYs) in primary economic modelling.
Inclusion criteria – economic evaluation studies	The following inclusion criteria will be applied to select economic evaluations identified by the economic searches for further consideration: • Only English language papers will be considered. • Studies published from 1990 onwards will be included. This date restriction is imposed to obtain data relevant to current practice. • Only studies from Organisation for Economic Co-operation and Development countries will be included, as the aim of the review is to identify economic information transferable to the UK context. • Inclusion and exclusion criteria for study population, diagnosis, intervention and comparator, and setting will be exactly the same as outlined in the clinical review protocol 3. • Studies will be included that provide sufficient details regarding methods and results to enable the methodological quality of the study to be assessed, and providing that the study's data and results are extractable. If available evidence is very limited conference abstracts, dissertations, and commentaries will be also included. • Economic studies that consider both costs and consequences (cost-effectiveness, cost–consequence, cost–utility, cost-minimisation and cost–benefit analyses) will be given priority. Given anticipated lack of full economic evaluations comparative cost studies will also be considered. Non-comparative costing studies, 'burden of disease' studies and 'cost of illness' studies will be excluded.
Inclusion criteria – studies reporting resource use and cost data	• The review will focus on UK-based studies but if no sufficient data are identified, non-UK studies will be reviewed. • Non-comparative costing studies will be included.

Component	Description
Inclusion criteria – utility studies	• Only studies reporting utility data elicited using a generic preference-based measure and a validated technique for valuation. • Utility data need to refer to specific states associated with the study population through the care pathway.
Data extraction	All relevant data from economic evaluations (such as study population, sample sizes, data sources, service delivery model and comparator, outcome, type of analysis, perspective, discounting and cost year, results including uncertainty) and from studies reporting utility data (including definition of health states and population reporting HRQoL, valuation method and population providing valuations, health state utility scores) will be extracted. Reasons for exclusion of potentially relevant studies will also be documented. In cases where there are missing data or unclear reporting in the published or submitted economic evidence or QoL studies, attempts may be made to contact authors, after discussion with members of the NICE team. Studies published in the UK will be reported in greater detail than non-UK studies as they are more likely to be relevant to this review.
Applicability and quality criteria for economic studies	All economic publications eligible for inclusion will be appraised for their applicability and quality using the methodology checklist for economic evaluations recommended by NICE (2014). All studies that fully or partially meet the applicability and quality criteria described in the methodology checklist will be considered in the review. The completed checklists for all economic evaluations considered in this review will be provided.
Presentation of the results of the systematic review of economic evidence	A narrative summary and the accompanying economic evidence tables will be presented to summarise evidence from published economic evaluations. Utility studies and studies reporting relevant resource use and/or cost data will be described in a narrative summary in the report
Economic modelling (methods for estimating QoL, costs and cost-effectiveness and/or cost/QALY	**Model type** The structure of the economic model will be determined by the pathways associated with service delivery models being evaluated, and the availability of relevant clinical, utility and cost data. A decision analytical model will be used to assess the cost effectiveness of service delivery models that may include the following configurations: • Integrated models of care; • parallel models of care; • serial models of care; • any other model(s) of care identified in the clinical review. **Time horizon** The time horizon of the analysis will depend on the availability of data. Ideally the time horizon of the model will be over lifetime, so as to capture the long-term costs and consequences. However, if no appropriate data are available to allow a lifetime horizon, the matter will be discussed with the NICE team and a shorter timeframe may be adopted.

Component	Description
	Cost data There will be 2 perspectives chosen and analysed separately: public sector and societal. If suitable data are identified the analysis will consider: • service provision costs and other direct healthcare costs (for example, outpatient mental health and substance misuse visits, CMHTs, GP care, community psychiatric nurses, specialist social worker/support worker, accident and emergency, detoxification and so on) • criminal justice system costs (for example, police, court, prison and so on) • community care costs (for example, homeless shelters, day care provision, other residential stays and so on) • informal care costs Data on quantities of resources used will be identified from primary data from relevant sources and the reviewed literature and if necessary they will be supplemented with expert opinion. As appropriate, unit cost data will be obtained from national sources such as the NHS reference costs, Drug Tariff, national Unit Costs of Health and Social Care, and other published sources. **Consequences** The effectiveness parameters required for the economic model will be informed by the review of the effectiveness literature outlined in Clinical review protocol 3. Where possible the economic analysis will compare differences between different service delivery models in terms of: • HRQoL (for example, European Quality of Life – 5 Dimensions [EQ-5D[) and general wellbeing (for example, Quality of Well-Being Scale); • housing needs (for example, the number requiring sheltered accommodation, supported living); • employment (for example, number returning to employment); • dependence on benefits (for example, levels of benefits claimed); • levels of admission to secure settings (for example, forensic secure mental health settings, prisons and other custodial settings). If possible estimation of QALYs will also be undertaken. **Utility data** If it is possible, cost–utility analysis will be undertaken; estimates of QoL (utility data) will be informed by the published literature identified in the systematic review. However, if there are no studies reporting QoL scores for the population of interest, expert clinical opinion could be used to identify utility data from similar indications that may be used as proxy utility data. In accordance with NICE methods guidance, utility values will be ideally based on EQ-5D data that have been converted to utilities using the UK time trade-off tariff.

Component	Description
	Discounting Where appropriate costs and consequences will be discounted at 3.5% as recommended by NICE (NICE, 2014). Sensitivity analyses using 1.5% as an alternative rate for both costs and consequences will be presented alongside the reference-case analysis. **Costs** Costs where necessary will be converted to pounds sterling using trading exchange rates and PPP exchange rates in the year of the intervention, and then expressed in prices of the latest year in which the pertinent price index is available. **Sensitivity analysis** Sensitivity analysis will be used to explore the impact of uncertainty could have on model results. • Deterministic sensitivity analysis will be used to explore key structural assumptions: testing whether and how the model results in change under alternative, plausible scenarios. It will also be used to test uncertainty resulting from the data sources selected for key model parameters. • Where the overall results are sensitive to a particular variable, threshold analysis will be employed to explore the exact nature of the impact of variations (for example, how much would a value of parameter need to change for a decision/recommendation to change?). • Probabilistic sensitivity analysis will be performed to explore the uncertainty arising from imprecision in model parameters. **Subgroup analysis** Where appropriate, the economic model will be run to estimate the cost effectiveness of various service delivery models in different population subgroups (for example, young people, homeless people, women, people from black and minority ethnic groups). **Method of data analysis** Due to anticipated range of outcomes a formal combination of consequences may not be possible; cost–consequences analysis will be undertaken where consequences will be reported in a disaggregated fashion (for example, costs associated with 'integrated model of care' and improvement/deterioration in HRQoL, general wellbeing and so on). If appropriate data are available, cost–utility analysis will also be performed in which case ICERs (that is, cost per QALY estimates) will be provided. Cost, consequences and/or cost-effectiveness estimates from economic analyses conducted for the review will be presented in an economic evidence table and also in a narrative form in the report. The outputs of probabilistic sensitivity analysis will be presented as a scatter graph in the cost-effectiveness plane and through the use of cost-effectiveness acceptability curves. **Applicability and quality criteria for economic model developed**

Component	Description
	for this review The economic model developed specifically for this review will be appraised for its applicability and quality using the methodology checklist for economic evaluations recommended by NICE (NICE, 2014). The completed checklist will be provided. **Presentation of the modelling results conducted for this review** A narrative summary of the methods and results of the modelling (from both public sector and societal perspectives) conducted for this review will be provided in the report following presentation of the relevant clinical evidence.
Economic evidence summary	Short economic evidence statements will be provided in the report that will summarise evidence from the systematic review of existing economic studies and the economic modelling undertaken for this review.

APPENDIX 2 SAMPLE SEARCH STRATEGY

RQ 4: Which service models for health, social care and voluntary and community sector organisations are cost-effective and efficient at meeting the needs of people with a severe mental illness who also misuse substances?

Sample search for health economic and QoL studies

Database(s): **Ovid MEDLINE (r)** 1946 to 2015
Date run: March week 3

#	Searches
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/
2	emergency services, psychiatric/ or hospitals, psychiatric/ or psychiatric department, hospital/ or (mentally ill persons/ and (inpatients/ or hospitalization/))
3	((bipolar* adj (depres* or disorder*)) or ((cyclothymi* or rapid or ultradian) adj2 cycl*) or rcbd or mania* or manic*).ti,ab.
4	(delusional disorder* or psychos* or psychotic* or schizophren*).ti,ab.
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.
6	depres*.ti,ab.
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.
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.
9	or/1-8
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 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/
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.
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.
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 using or utiliz* or utilis*)).ti,ab.
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.
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 using or utiliz* or utilis*)).ti,ab.
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.
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 using or utiliz* or utilis*)).ti,ab.
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* 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 using or utiliz* or utilis*)).ti,ab.
21	or/10-20

22	abus* product*.ti,ab.
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.
24	(((alcohol* or drug*1 or polydrug* or recreation* or substance*) adj use*1) or alcoholi*).ti,ab.
25	((club or designer or street) adj (drug* or substance*)).ti,ab.
26	((crav* adj2 (alcohol* or inject*)) or hard drug* or needle fixation or soft drug* or vsa*1).ti,ab.
27	or/22-26
28	or/21,27
29	“diagnosis, dual (psychiatry)”/
30	(chemical* adj (user or addict*) adj3 ((mental* or psychiatric or psychological*) adj (condition* or disease* or disorder* or disturbanc* or ill*))).ti,ab.
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.
32	((dual* or tripl*) adj2 diagnos*).ti,ab.
33	or/29-32
34	(9 and 28) or 33
35	exp budgets/ or exp "costs and cost analysis"/ or economics/ or exp economics, hospital/ or exp economics, medical/ or economics, nursing/ or economics, pharmaceutical/ or exp "fees and charges"/ or value of life/
36	budget*.ti,ab.
37	cost*.ti,ab.
38	(economic* or pharmacoeconomic*).ti.
39	(fee or fees or financ*).ti,ab.
40	(price* or pricing*).ti,ab.
41	(value adj2 (money or monetary)).ti,ab.
42	or/35-41
43	quality-adjusted life years/ or sickness impact profile/
44	disability adjusted life.ti,ab.
45	(euroqol* or eq5d* or eq 5d*).ti,ab.
46	health* year* equivalent*.ti,ab.
47	(health utility* or utility score* or disutilit* or dis utilit*).ti,ab.
48	(hui or hui1 or hui2 or hui3).ti,ab.
49	(hye or hyes).ti,ab.
50	(qal* or qtime* or qwb* or daly* or ((wellbeing or well being) adj scale)).ti,ab.
51	(qol* or hql* or hqol* or hrqol*).ti,ab.

52	((general or quality) adj2 (wellbeing or well being)).ti,ab.
53	(sf12 or sf 12 or short form 12 or shortform 12 or shortform12).ti,ab.
54	(sf20 or sf 20 or short form 20 or shortform 20 or shortform20).ti,ab.
55	(sf36 or sf 36 or short form 36 or shortform 36 or shortform36).ti,ab.
56	(sf6 or sf 6 or short form 6 or shortform 6 or shortform6).ti,ab.
57	(sf8 or sf 8 or short form 8 or shortform 8 or shortform8).ti,ab.
58	rosser.ti,ab.
59	sickness impact profile.ti,ab.
60	(willingness to pay or wtp or time tradeoff or time trade off or tto or standard gamble*).ti,ab.
61	or/43-60
62	or/42,61
63	34 and 62
64	exp animals/ not humans/
65	63 not 64
66	limit 65 to english language
67	limit 66 to yr="1990 -current"

Sample search for data for population of cost-consequences model

Database: Medline 1946 to 2015
Interface: OVID
Date run: March week 3

#	searches
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/
2	emergency services, psychiatric/ or hospitals, psychiatric/ or psychiatric department, hospital/ or (mentally ill persons/ and (inpatients/ or hospitalization/))
3	((bipolar* adj (depres* or disorder*)) or ((cyclothymi* or rapid or ultradian) adj2 cycl*) or rcbd or mania* or manic*).ti,ab.
4	(delusional disorder* or psychos* or psychotic* or schizophren*).ti,ab.
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.
6	depres*.ti,ab.
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.
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.
9	or/1-8
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 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/
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.
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.
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 using or utiliz* or utilis*)).ti,ab.
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.
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 using or utiliz* or utilis*)).ti,ab.
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.
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 using or utiliz* or utilis*)).ti,ab.
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* 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 using or utiliz* or utilis*)).ti,ab.
21	or/10-20
22	abus* product*.ti,ab.
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.
24	(((alcohol* or drug*1 or polydrug* or recreation* or substance*) adj use*1) or alcoholi*).ti,ab.
25	((club or designer or street) adj (drug* or substance*)).ti,ab.
26	((crav* adj2 (alcohol* or inject*)) or hard drug* or needle fixation or soft drug* or vsa*1).ti,ab.
27	or/22-26
28	or/21,27
29	“diagnosis, dual (psychiatry)”/
30	(chemical* adj (user or addict*) adj3 ((mental* or psychiatric or psychological*) adj (condition* or disease* or disorder* or disturbanc* or ill*))).ti,ab.
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.
32	((dual* or tripl*) adj2 diagnos*).ti,ab.
33	or/29-32
34	(9 and 28) or 33
35	case management/ or cooperative behavior/ or "continuity of patient care"/ or delivery of health care/ or delivery of health care, integrated/ or interprofessional relations/ or interinstitutional relations/ or multi-institutional systems/ or models, organizational/ or patient care team/ or patient centered care/ or community health planning/ or decision making, organizational/ or health care reform/ or health facility administration/ or health facility planning/ or health planning/ or health planning guidelines/ or health plan implementation/ or health resources/ or health services administration/ or exp health planning organizations/ or health systems plans/ or institutional management teams/ or national health programs/ or organizational innovation/ or patient care planning/ or planning techniques/ or program development/ or public health administration/ or regional health planning/ or regional medical programs/ or resource allocation/ or state health plans/
36	(algorithm* or pathway* or (treatment adj (delivery or guideline* or program* or protocol*))).ti,ab.
37	(((assertive or proassertive) adj2 (communit* or outreach or treatment*)) or act model*).ti,ab.
38	((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.
39	(((care or case*) adj manag*) or managed care program* or (patient care adj (plan* or team*))).ti,ab.
40	(cluster adj3 health* adj3 social*).ti,ab.
41	((complex or organi?ational) adj intervention*).ti,ab.
42	((comprehensive adj2 (care or management or service or treatment)) or (managed adj (behavioral or behavioural) adj health) or (model* adj2 (approach* or care or consultation or integrated or service* or team* or treatment*))).ti,ab.
43	(co located team or co location or (joint service adj3 development) or linkwork* or multidisciplinary assessment or one stop shop or (pool* adj3 budget) or single assessment or strategic collaboration).ti,ab.
44	consultation liaison.ti,ab.
45	((contin* or coordinated or co ordinated or joint* or joined up or progression or seamless* or structured or uninterrupted) adj3 (care or healthcare or service*)).ti,ab.
46	(((continuous or integrated or joint or overlapping) adj commission*) or provider partnership*).ti,ab.
47	(continuity adj2 (care or healthcare)).ti,ab.
48	(((cooperative or co operative) adj behav*) or ((interpersonal or inter personal or interprofession* or inter profession* or interinstitution* or inter institution*) adj (work* or relation*))).ti,ab.
49	(flexible partnership* or (joint* adj3 working) or joined up partnership* or (partnership* adj3 working) or partnership project*).ti,ab.
50	(((horizontal or vertical) adj integrat*) or horizontal communication*).ti,ab.
51	(imhc or integrated psychiatry).ti,ab.
52	(integrat* adj3 health*).ti,ab.
53	((model* or pathway*) adj3 (approach* or care or healthcare or program* or psychotherap* or service* or specialit* or therap* or treatment*)).ti,ab.
54	((parallel or serial) adj2 (care or healthcare or model* or service* or therap* or treatment*)).ti,ab.
55	((premobile or pre mobile) adj3 (approach* or care or communit* or healthcare or program* or service* or therap* or treatment or work*)).ti,ab.
56	(system* adj2 care).ti,ab.
57	((deliver* or implement* or needs or organi* or plan* or utili*) adj3 (care or healthcare or model* or program* or service* or system*)).ti,ab.
58	or/35-57
59	assisted living facilities/ or group homes/ or halfway houses/ or homeless

	persons/ or residential facilities/ or residential treatment/ or therapeutic community/
60	(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*).ti,ab.
61	((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.
62	(((assist* or cooperative or co operative or independen* or staffed or supportive) adj2 (care or living)) or staff* model*).ti,ab.
63	(board* adj2 care).ti,ab.
64	((concept or support) adj house).ti,ab.
65	((communit* or mental health) adj2 (living or place* or resettl* or residence*)).ti,ab.
66	floating support.ti,ab.
67	(group adj (dwelling* or home*)).ti,ab.
68	(hous* adj2 (association* or officer* or resident*)).ti,ab.
69	(place* adj3 (adult* or famil* or person*)).ti,ab.
70	(resident* adj3 (continuum or facilit* or independen* or setting* or status)).ti,ab.
71	psychosocial therap*.ti,ab.
72	single room.ti,ab.
73	supporting people program*.ti,ab.
74	((therapeutic adj2 community) or modified tc).ti,ab.
75	or/59-74
76	career mobility/ or exp employment/ or occupational health/ or occupational medicine/ or occupational therapy/ or rehabilitation, vocational/ or sheltered workshops/ or vocational education/ or exp work/
77	(club house* or clubhouse* or fountain house* or work therap*).ti,ab.
78	(employ* or job*1 or occupat* or reemploy* or unemploy* or vocation* or work*).ti,ab.
79	((individual placement adj2 support) or ips model).ti,ab.
80	((permitted or voluntary or rehab*) adj3 work*).ti,ab.
81	((psychiatric or psychosocial or psycho social or social) adj2 rehab*).ti,ab.
82	rehabilitation counsel*.ti,ab.
83	(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.
84	vocational outcome*.ti,ab.
85	or/76-84
86	public assistance/ or social welfare/
87	((social* adj2 (benefits or care or security or welfare or work*)) or welfare benefit*).ti,ab.
88	or/86-87
89	forensic psychiatry/ or prisoners/ or prisons/
90	(felon$ or gaol$ or incarcerat$ or inmate$ or in$1 mate$ or jail$ or parol$1 or

	penitentiar$ or prison$).ti,ab.
91	hospitals, psychiatric/ or psychiatric department, hospital/
92	(psychiatric$ adj2 (establishment$ or facility$ or inpatient* or in$1 patient$ or setting$ or unit$ or ward$)).ti,ab.
93	or/89-92
94	"*quality of life"/
95	(quality adj2 life).ti,ab.
96	or/94-95
97	welfare.ti,ab,hw.
98	58 and (or/75,85,88,93,96-97)
99	34 and 98
100	exp animals/ not humans/
101	99 not 100
102	limit 101 to english language
103	limit 102 to yr="1990 -current"

APPENDIX 3 PROTOCOL FOR EVIDENCE REVIEW 3

Component	Description
Review question	Review question (RQ) 3: Which service models for health, social care and voluntary and community sector organisations are effective and efficient at meeting the needs of people with a dual diagnosis?
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 or other healthcare systems, social care and schools, as well as the community and voluntary sectors). Studies from any Organisation for Economic Co-operation and Development (OECD) member country will be included. However, applicability to the UK service setting will be considered during data analysis and synthesis. Excluded: • non-OECD studies • prisons and other custodial settings • young offenders units • forensic secure mental health settings
Population	Included: young people (aged 14 to 24 years) and adults (25 years and over) 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) • people with a severe mental illness but with no evidence of substance misuse • people who misuse substances who have not been diagnosed with a severe mental illness • 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),	Included:

Component	Description
exposure(s)	Any service delivery model, including: • Integrated models of care: mental health and substance misuse treatments are delivered by the same service, clinician or team of clinicians at the same time (for example, assertive community treatment [ACT], case management, integrated motivational interviewing and cognitive behavioural therapy, mainstreaming) • Parallel models of care: separate treatment programmes are delivered in parallel by mental health and substance misuse services • Serial models of care: separate treatment programmes are delivered sequentially by mental health and substance misuse services • Measures aimed at improving accessibility and availability of services, for example, services available 24 hours a day, 7 days a week • Measures aimed at promoting uptake of and engagement with services, for example, practical help (such as reminders to attend) and non-clinical activities (such as 'coffee mornings') Excluded: Not applicable
Comparator(s)/control	Included: • Treatment as usual (TAU) • No treatment • Waitlist control • Placebo (including attention control) • Any alternative service delivery model Excluded: Not applicable
Primary/critical outcomes	• Mental and physical health outcomes (including mortality, recovery and relapse, physical morbidity) • Accessibility of services (for instance, transfer/referral times, waiting times, physical accessibility of services) • Acceptability of services (for instance, service user, carer and family satisfaction with care) • Adaptive functioning outcomes (for instance, employment, housing, quality of life) • Service utilisation (for instance, number of missed appointments, changes in treatment adherence)
Study design	Included: RCTs (including crossover randomised trials if data from the first phase is available) from all OECD countries If there are no RCTs found in the evidence search, or the results from the RCTs are inconclusive, the range of included studies will be expanded to include non-randomised studies from the UK and Ireland only. Preference will be given to quasi-RCTs (for example, allocation by alternation or date of birth), controlled non-randomised studies and large cohort studies. If little evidence meets the above criteria, then before-and-after studies will be considered cautiously. Excluded: commentaries, editorials, vignettes, books, policy and guidance, and non-empirical research

APPENDIX 4 COMPLETED METHODOLOGY CHECKLISTS

Assertive community treatment

Study identification **Clark RE, Teague GB, Ricketts SK, Bush PW, Xie H, McGuire TG, et al. Cost-effectiveness of assertive community treatment versus standard case management for persons with co-occurring severe mental illness and substance use disorders. Health Services Research. 1998;33:1285-308.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	IACT versus integrated SCM
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare, social care, criminal justice) and informal care
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	Partly	Base-case analysis no discounting; additional analysis using 3% and 5% for costs and outcomes, respectively
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Partly	SATS, Quality of Life Interview, QALYs
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Partially applicable		
Other comments: Utility values were derived using non-validated measure that was developed by the authors specifically for this study		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature	NA	Economic analysis

of the topic under evaluation?		conducted alongside an RCT
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon 3 years
2.3 Are all important and relevant outcomes included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From an RCT
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	From an RCT
2.6 Are all important and relevant costs included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.7 Are the estimates of resource use from the best available source?	Yes	RCT; management information systems; self-reports, clinical reports, hospital records, Medicaid payments; other local and state police, court, jail, prison, community mental health centre, and social service agencies
2.8 Are the unit costs of resources from the best available source?	Partly	Local sources including audited cost reports, public expenditure records, service providers' financial records
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Intervention dominant
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Statistical analyses conducted
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Minor limitations		
Other comments:		

Study identification **Morse GA, Calsyn RJ, Dean Klinkenberg W, Helminiak TW, Wolff N, Drake RE, et al. Treating homeless clients with severe mental illness and substance use disorders: Costs and outcomes. Community Mental Health Journal. 2006;42:377-404.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/ no/unclear /NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Homeless individuals with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	IACT, ACT
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare and social care)
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	No	No consideration of employment outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	No	Time horizon 2 years
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	Service user satisfaction scale (10-item scale developed for this project); stability of housing (days living in stable housing); BPRS; means scores on non-specified scale to measure the severity of both alcohol and drug use; substance use (number of days in the past 90 days that service users used alcohol and also the number of days they used other substances)
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Partially applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/ no/unclear /NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of	NA	Economic analysis

the topic under evaluation?		conducted alongside an RCT
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon 2 years
2.3 Are all important and relevant outcomes included?	Partly	No consideration of employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From an RCT
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	From an RCT
2.6 Are all important and relevant costs included?	Partly	Only healthcare and social care costs considered
2.7 Are the estimates of resource use from the best available source?	Partly	From an RCT; service agencies, claims records, state and other local service provider information systems
2.8 Are the unit costs of resources from the best available source?	Partly	National and local sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Cost-consequences analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Statistical analyses conducted
2.11 Is there any potential conflict of interest?	NA	Unclear
2.12 Overall assessment: Minor limitations		
Other comments:		

Integrated treatment

Study identification **Judd PH, Thomas N, Schwartz T, Outcalt A, Hough R. A dual diagnosis demonstration project: Treatment outcomes and cost analysis. Journal of Psychoactive Drugs. 2003;35:181-92.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	An integrated treatment program
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they	Yes	Public sector

appropriate for the review question?		(healthcare, social care and the criminal justice system)
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	No	Time horizon up to 3 years
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	ASI-Lite, the Kennedy Axis V subscales, Behavioural and Symptom Identification Scale 32 (BASIS-32), CES-D, CA-QOL, SF-12, the Pearlin Mastery scale, the Rosenberg Self-Esteem Scale, BHRS; recovery status of service users as rated by the programme manager and care co-ordinators; employment status; and legal status (measured using ASI)
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Partially applicable		
Other comments: cost–consequences analysis		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Based on a before-after study
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon up to 3 years
2.3 Are all important and relevant outcomes included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From a before-after study
2.5 Are the estimates of relative intervention effects from the best available source?	Partly	From a before-after study

2.6 Are all important and relevant costs included?	Partly	Healthcare, social care, and criminal justice system costs
2.7 Are the estimates of resource use from the best available source?	Partly	Before-after study; the state-wide criminal justice database, the California Alcohol and Drug Data System, the California Department of Health Services databases
2.8 Are the unit costs of resources from the best available source?	No	Local sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Cost-consequences analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Potentially serious limitations		
Other comments:		

Study identification **Lambert MT. Linking mental health and addiction services: a continuity-of-care team model. The Journal of Behavioral Health Services & Research. 2002;29:433-44.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Integrated addiction treatment services with general psychiatric care
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Partly	Healthcare payer
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	No	Did not consider health outcomes only satisfaction with services; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to

		secure settings
1.6 Are all future costs and outcomes discounted appropriately?	NA	Time horizon 1 year
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	Outcome was satisfaction with services only
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	NA	Healthcare costs only
1.9 Overall judgement: Partially applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Based on a before-after study
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	Time horizon 1 year
2.3 Are all important and relevant outcomes included?	No	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From a before-after study. The size of the study was not reported.
2.5 Are the estimates of relative intervention effects from the best available source?	Partly	From a before-after study
2.6 Are all important and relevant costs included?	No	No consideration of wider public sector costs
2.7 Are the estimates of resource use from the best available source?	Partly	From a before-after study
2.8 Are the unit costs of resources from the best available source?	Unclear	
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Intervention dominant
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Very serious limitations		
Other comments:		

Integrated treatment based on case management

Study identification **Jerrell JM. Cost-effective treatment for persons with dual disorders. New Directions for Mental Health Services. 1996:79-91.** **AND** **Jerrell JM, Hu TW. Estimating the cost impact of three dual diagnosis treatment programs. Evaluation Review. 1996;20:160-80.** **AND** **Jerrell JM, Wilson JL. The utility of dual diagnosis services for consumers from non-white ethnic groups. Psychiatric Services. 1996;47:1256-58.** **AND** **Jerrell JM, Ridgely MS. Gender differences in the assessment of specialized treatments for substance abuse among people with severe mental illness. Journal of Psychoactive Drugs. 1995;27:347-55.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Integrated treatment including: intensive case management, behavioural skills model, and 12-Steps model
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare, social care and the criminal justice) and informal care
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	NA	Cost analysis
1.6 Are all future costs and outcomes discounted appropriately?	Partly	Time horizon 18 months
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	NA	Cost analysis
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Yes	
1.9 Overall judgement: Partially applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Economic analysis conducted alongside an RCT

2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon 18 months
2.3 Are all important and relevant outcomes included?	NA	Cost analysis
2.4 Are the estimates of baseline outcomes from the best available source?	NA	Cost analysis
2.5 Are the estimates of relative intervention effects from the best available source?	NA	Cost analysis
2.6 Are all important and relevant costs included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.7 Are the estimates of resource use from the best available source?	Partly	From an RCT
2.8 Are the unit costs of resources from the best available source?	Unclear	
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Cost analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	No	
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Potentially serious limitations		
Other comments:		

Study identification **Jerrell JM, Ridgely M. The relative impact of treatment program 'robustness' and 'dosage' on client outcomes. Evaluation and Program Planning. 1999;22:323-30**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5) **This checklist should be used first to filter out irrelevant studies.**	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Integrated treatment including: intensive case management, behavioural skills model, and AA/12-Steps model
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare and social care)
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of housing needs,

		employment outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	No	Time horizon 24 months
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	SAS-II, RFS
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Partially applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Economic analysis conducted alongside an RCT
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon 24 months
2.3 Are all important and relevant outcomes included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From an RCT
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	From an RCT
2.6 Are all important and relevant costs included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.7 Are the estimates of resource use from the best available source?	Partly	From an RCT; billing and claims data; criminal justice system; and other local sources
2.8 Are the unit costs of resources from the best available source?	Partly	Local mental health authority's management information, billing and claims information, county department cost

		accounting data, and other local sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Calculated
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Statistical analyses conducted
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Potentially serious limitations		
Other comments:		

Study identification **Jerrell JM, Wilson JL, Hiller DC. Issues and outcomes in integrated treatment programs for dual disorders. Journal of Behavioral Health Services and Research. 2000;27:303-13.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5)	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Integrated dual diagnosis day-treatment model
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Partly	US study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare and social care)
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of employment outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	NA	Time horizon 12 months
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	SAS; RFS; DIS; CUAD; SLS; the CSQ-8
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Partially applicable		
Other comments: cost–consequences analysis		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Based on an observational study
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	No	Time horizon 12 months

2.3 Are all important and relevant outcomes included?	Partly	No consideration of employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From a before-after study
2.5 Are the estimates of relative intervention effects from the best available source?	Partly	From a before-after study
2.6 Are all important and relevant costs included?	Partly	Only healthcare and social care costs were included
2.7 Are the estimates of resource use from the best available source?	Partly	From a before-after study
2.8 Are the unit costs of resources from the best available source?	No	Local sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	NA	Cost–consequences analysis
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Partly	Some statistical analyses conducted
2.11 Is there any potential conflict of interest?	Unclear	
2.12 Overall assessment: Potentially serious limitations		
Other comments:		

Other interventions

Study identification **Craig TKJ, Johnson S, McCrone P, Afuwape S, Hughes E, Gournay K, et al. Integrated care for co-occurring disorders: Psychiatric symptoms, social functioning, and service costs at 18 months. Psychiatric Services. 2008;59:276-82.**		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5) **This checklist should be used first to filter out irrelevant studies.**	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Integrated service delivery model
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Yes	UK study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Yes	Public sector (healthcare, social care and the criminal justice system)
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of housing needs, employment

		outcomes, dependence on benefits, and levels of admissions to secure settings
1.6 Are all future costs and outcomes discounted appropriately?	Partly	Time horizon 18 months
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	No	BPRS, CANSAS, LSP, MANSA, CSQ, TPQ, MAP, AUDIT, DALI, units of alcohol consumption
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Directly applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	NA	Economic analysis conducted alongside an RCT
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon18 months only
2.3 Are all important and relevant outcomes included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From an RCT
2.5 Are the estimates of relative intervention effects from the best available source?	Yes	From an RCT
2.6 Are all important and relevant costs included?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings
2.7 Are the estimates of resource use from the best available source?	Partly	From an RCT
2.8 Are the unit costs of resources from the best available source?	Yes	National sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	Calculated
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	Statistical analyses conducted
2.11 Is there any potential conflict of interest?	No	
2.12 Overall assessment: Minor limitations		

Other comments:

Study identification Economic analysis conducted for this review assessing treatment engagement intervention plus SC compared with SC alone		
Guidance topic: Severe mental illness and substance misuse (dual diagnosis): community health and social care services		**Question no: 4**
Checklist completed by: Eric Slade		
Section 1: Applicability (relevance to specific review questions and the NICE reference case as described in section 7.5) **This checklist should be used first to filter out irrelevant studies.**	**Yes/partly/no /unclear/NA**	**Comments**
1.1 Is the study population appropriate for the review question?	Yes	Adults with dual diagnosis
1.2 Are the interventions appropriate for the review question?	Yes	Treatment engagement intervention
1.3 Is the system in which the study was conducted sufficiently similar to the current UK context?	Yes	UK study
1.4 Are the perspectives clearly stated and are they appropriate for the review question?	Partly	NHS and PSS
1.5 Are all direct effects on individuals included, and are all other effects included where they are material?	Partly	No consideration of housing needs, employment outcomes, dependence on benefits
1.6 Are all future costs and outcomes discounted appropriately?	Partly	Time horizon 12 months
1.7 Is QALY used as an outcome, and was it derived using NICE's preferred methods? If not, describe rationale and outcomes used in line with analytical perspectives taken (item 1.4 above).	Partly	QALY gain required estimated as part of threshold analysis
1.8 Are costs and outcomes from other sectors fully and appropriately measured and valued?	Partly	
1.9 Overall judgement: Directly applicable		
Other comments:		
Section 2: Study limitations (the level of methodological quality)	**Yes/partly/no /unclear/NA**	**Comments**
2.1 Does the model structure adequately reflect the nature of the topic under evaluation?	Partly	Due to data limitations the model is a very simplified representation of real clinical practice
2.2 Is the time horizon sufficiently long to reflect all important differences in costs and outcomes?	Partly	Time horizon 12 months
2.3 Are all important and relevant outcomes included?	No	No consideration of housing needs, employment outcomes, dependence on

		benefits
2.4 Are the estimates of baseline outcomes from the best available source?	Partly	From an RCT
2.5 Are the estimates of relative intervention effects from the best available source?	No	Based on assumption
2.6 Are all important and relevant costs included?	No	No consideration of housing needs, employment outcomes, dependence on benefits
2.7 Are the estimates of resource use from the best available source?	Partly	From an RCT
2.8 Are the unit costs of resources from the best available source?	Yes	National sources
2.9 Is an appropriate incremental analysis presented or can it be calculated from the data?	Yes	
2.10 Are all important parameters whose values are uncertain subjected to appropriate sensitivity analysis?	Yes	A range of deterministic 1- and 2-way sensitivity analyses
2.11 Is there any potential conflict of interest?	No	
2.12 Overall assessment: Potentially serious limitations		
Other comments:		

APPENDIX 5 BIBLIOGRAPHY OF INCLUDED STUDIES FOR RQ 4

Clark RE, Teague GB, Ricketts SK, Bush PW, Xie H, McGuire TG, et al. Cost-effectiveness of assertive community treatment versus standard case management for persons with co-occurring severe mental illness and substance use disorders. Health Services Research. 1998;33:1285-308.

Craig TKJ, Johnson S, McCrone P, Afuwape S, Hughes E, Gournay K, et al. Integrated care for co-occurring disorders: Psychiatric symptoms, social functioning, and service costs at 18 months. Psychiatric Services. 2008;59:276-82.

Jerrell JM, Hu TW. Estimating the cost impact of three dual diagnosis treatment programs. Evaluation Review. 1996;20:160-80.

Jerrell JM, Ridgely M. The relative impact of treatment program 'robustness' and 'dosage' on client outcomes. Evaluation and Program Planning. 1999;22:323-30.

Jerrell JM, Ridgely MS. Gender differences in the assessment of specialized treatments for substance abuse among people with severe mental illness. Journal of Psychoactive Drugs. 1995;27:347-55.

Jerrell JM, Wilson JL, Hiller DC. Issues and outcomes in integrated treatment programs for dual disorders. Journal of Behavioral Health Services and Research. 2000;27:303-13.

Jerrell JM, Wilson JL. The utility of dual diagnosis services for consumers from non-white ethnic groups. Psychiatric Services. 1996;47:1256-58.

Jerrell JM. Cost-effective treatment for persons with dual disorders. New Directions for Mental Health Services.1996:79-91.

Judd PH, Thomas N, Schwartz T, Outcalt A, Hough R. A dual diagnosis demonstration project: Treatment outcomes and cost analysis. Journal of Psychoactive Drugs. 2003;35:181-92.

Lambert MT. Linking mental health and addiction services: a continuity-of-care team model. The Journal of Behavioral Health Services & Research. 2002;29:433-44.

Morse GA, Calsyn RJ, Dean Klinkenberg W, Helminiak TW, Wolff N, Drake RE, et al. Treating homeless clients with severe mental illness and substance use disorders: Costs and outcomes. Community Mental Health Journal. 2006;42:377-404.

APPENDIX 6 EVIDENCE TABLES FOR ECONOMIC EVALUATIONS

Assertive community treatment

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Limitations
Clark RE, Teague GB, Ricketts SK, Bush PW, Xie H, McGuire TG, et al. Cost-effectiveness of assertive community treatment versus standard case management for persons with co-occurring severe mental illness and substance use disorders. Health Services Research. 1998;33:1285-308.	RCT with economic evaluation	Partially applicable Minor limitations [++]	*Country:* US *Setting:* community mental health centre *Location:* New Hampshire	Specialized treatment for dual disorders in an assertive community treatment (ACT) team based on an integrated treatment. ACT team provided direct substance misuse treatment.	Standard care (SC) defined as standard case management (SCM) with targeted substance abuse (SA) treatment based on an integrated treatment. SCM provided less individual treatment for SA, didn't have team focus, and gave less intensive service.	*Effectiveness data:* n=223 baseline; n=203 follow-up *Resource use estimates*: n=193	*Type of economic analysis:* cost-effectiveness analysis *Population:* adults with serious mental illness (schizophrenia, schizoaffective disorder or bipolar disorder) and SA disorders. SA disorders are not reported. *Data sources:* Effectiveness data: RCT Resource use estimates: RCT; and interlinked management information systems; self-reports, clinical reports, hospital records, Medicaid payments, Medicare cost reports; other local and state police, court, jail, prison, community mental health centre, and social service agencies Unit costs: local sources (audited	*Costs:* Mean undiscounted public sector (including informal care) per-person costs over 3 years: • ACT: $118,078 (SD $81,437) • SC: $124,145 (SD $63,143) • Difference: -$6,067, p=ns *Outcomes:* Mean SATS scores at baseline and at the end of the 3 years: • ACT improved from 2.8 to 5.1, p<0.001 • SC improved from 2.8 to 4.9, p<0.001 • Difference of 2.3 versus 2.1 Mean cumulative ratings on the SATS over 3 years: • ACT: 26.45 • SC: 26.00 • Difference: 0.45 (in favour of ACT), p=ns Subjective mean quality of life scores at baseline and at the end of the 3 years: • ACT improved from 0.56 to 0.66, p<0.001 • SC improved from 0.61 to 0.65, p<0.08 • Difference of 0.10 versus 0.04 was not statistically significant Mean QALYs over the 3 years: • ACT: 1.77 • SCM: 1.74	*Identified by authors:* generalisability issues (SC comparison group probably received better service than is available as SC in many areas; lack of ethnic diversity among study participants; and rural setting) *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes from an RCT; the unit costs of resources from local sources	*Source of funding:* the National Institute of Mental Health and the National Institute on Alcohol Abuse and Alcoholism, and by the New Hampshire Division of Mental Health and Developmental Services *Evidence gaps:* little is known about the cost-effectiveness of integrated treatment compared to traditional interventions for dual disorders *Further research identified:* programmes should be evaluated in a broad context (that is, societal perspective)

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Limitations
							cost reports, public expenditure records, service providers' financial records) *Time horizon:* 3 years *Discount rates:* as an additional analysis using 3% and 5% for costs and outcomes, respectively *Perspective: p*ublic sector (healthcare, social care, criminal justice) and informal care *Measures of uncertainty:* statistical and sensitivity analyses	• Difference: 0.03 (in favour of ACT), p=ns *Cost-effectiveness:* ACT dominant using SA and QALYs as outcome measures; however, differences in costs and outcomes was not statistically significant *Sensitivity analysis:* Discounting did not significantly alter the results The results were robust to changes in the estimates of informal caregiving and legal costs *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on RCT		

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Morse GA, Calsyn RJ, Dean Klinkenberg W, Helminiak TW, Wolff N, Drake RE, et al. Treating homeless clients with severe mental illness and substance use disorders: Costs and outcomes.	RCT with economic evaluation (Fletcher 2008)	Partially applicable Minor limitations [++]	*Country:* US *Setting:* a small community mental health agency *Location:* Missouri-St. Louis	Integrated assertive community treatment (IACT), assertive community treatment only (ACT)	Standard care (SC) care by community agencies that provided mental health and substance abuse (SA) treatment	*Effectiveness data:* n=149 *Resource use estimates:* n=149	*Type of economic analysis:* cost-consequences analysis *Population:* homeless adults with co-occurring SA and severe mental illness (schizophrenia, schizoaffective disorder, atypical psychotic disorder, bipolar disorder, major depression-	*Costs:* Mean public sector per-person costs at 6 months prior to entry, 1-6 months, 7-12 months, 13-18 months, and 18-24 months post-study entry, respectively: • IACT: $11,618, $16,421, $15,195, $14,960, $15,285 • ACT: $13,579, $20,342, $21,035, $21,389, $23,032 • SC: $12,668, $14,427, $14,756, $14,370, $12,776 Total public sector per-person costs over 24 months post-study	*Identified by authors:* treatment implementation problems; treatment drift; high attrition and concerns about generalizability to other samples; short follow-up *Identified by developer: s*hort time horizon; no consideration of employment	*Source of funding:* the National Institute of Mental Health, and the University of Missouri-St. Louis. *Evidence gaps:* the research evidence supporting the efficacy of integrated treatment is growing, although is still limited; research designs of many studies are inadequate; little evidence for specific subpopulations

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Community Mental Health Journal. 2006;42:377-404.							recurrent disorder, and delusional disorder) *Data sources:* Effectiveness data: RCT Resource use estimates: RCT, service agencies, claims records, state and other local service provider information systems Unit costs: service provider accounting and fiscal data, Medicaid payment rates *Time horizon:* 24 months plus 6 months prior to programme enrolment *Discount rates:* none applied *Perspective:* public sector (healthcare and social care) *Measures of uncertainty:* statistical analyses	entry: • IACT: $61,861 • ACT: $85,798 • SC: $56,329 IACT and SC had significantly lower costs when compared with ACT ($p \leq 0.05$) Difference between IACT and SC was not statistically significant *Outcomes:* Mean client satisfaction ratings at 6 months, 12 months, 18 months and 24 months post-study entry, respectively: • IACT: 5.00, 5.10, 5.10, 5.09 • ACT: 5.17, 5.23, 4.94, 4.99 • SC: 4.66, 4.75, 4.79, 4.67 • Service users in IACT and ACT were significantly more satisfied than service users in SC group, p=0.03 • There was no statistically significant difference in satisfaction levels between IACT and ACT groups, p=0.12 Mean stable housing days per participant at 6 months, 12 months, 18 months and 24 months post-study entry, respectively: • IACT: 8.19, 14.18, 17.01, 18.29 • ACT: 5.77, 13.87, 18.19, 17.78 • SC: 5.02, 11.34, 10.55, 12.59 The total stable housing days per participant over 24 months post-study entry, respectively: • IACT: 57.67 • ACT: 55.61 • SC: 39.48	outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes from an RCT; only healthcare and social care costs considered; the estimates of resource use from an RCT, service agencies, claims records, state and other local service provider information systems; the unit costs of resources from local and national sources	of people with severe mental illness, such as those who are incarcerated or those who are homeless *Further research identified:* more research is needed on the most cost-effective ways to serve people with dual disorders; to identify the client characteristics, service ingredients, and environmental factors that predict recovery for dual disorder clients; effectiveness and cost-effectiveness of combination of integrated treatment with residential and supportive housing arrangements, psychotropic medications, management, and community reinforcement approach

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
								Difference between ACT and SC, as well as between IACT and SC in mean and total stable housing days was statistically significant Difference between ACT and IACT in mean and total stable housing days was not statistically significant Mean BPRS scores at 6 months, 12 months, 18 months and 24 months post-study entry, respectively: • IACT: 1.94, 1.82, 1.81, 1.66 • ACT: 2.01, 1.83, 1.97, 1.88 • SC: 1.98, 1.92, 1.98, 1.86 • There were no statistically significant effect of treatment condition, p=0.10 Mean SA severity score at 6 months, 12 months, 18 months and 24 months post-study entry, respectively: • IACT: 3.15, 3.07, 2.83, 2.76 • ACT: 2.98, 2.86, 3.02, 2.70 • SC: 2.93, 2.78, 2.69, 2.62 • There were no statistically significant effect of treatment condition, p=0.72 Mean days used substances at 6 months, 12 months, 18 months and 24 months post-study entry, respectively: • IACT: 6.88, 8.28, 7.85, 7.43 • ACT: 6.25, 6.06, 6.62, 6.77 • SC: 6.34, 7.46, 7.10, 6.42 Total days used substances per participant over 24 months post-study entry, respectively: • IACT: 30.44 • ACT: 25.7		

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
								• SC: 27.32 There were no statistically significant effect of treatment condition on mean and total days of used substances, p=0.53 *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on RCT		

Integrated treatment

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Judd PH, Thomas N, Schwartz T, Outcalt A, Hough R. A dual diagnosis demonstration project: Treatment outcomes and cost analysis. Journal of Psychoactive Drugs. 2003;35:181-92.	Before-after study with economic evaluation	Partially applicable Potentially serious limitations [+]	*Country:* US *Setting:* outpatient public mental health service of a large, urban , di verse, university operated, psychiatric clinical facility *Location:* San Diego	An integrated treatment defined as a simultaneous focus on both disorders through the provision of psychosocial rehabilitation, psychotherapeutic and psychopharmacologic treatment, and SA recovery and relapse prevention by cross trained staff.	Standard care (SC) was not defined; however, it is believed that services were not integrated in any way	*Effectiveness data:* n=126 *Resource use estimates:* n=81	*Type of economic analysis:* cost-consequences analysis *Population:* adults with mental illness of depression or bipolar and psychotic illness; and who had a co-occurring substance disorder (alcohol, amphetamine, cannabis, opioid, sedative/anxiolytic, hallucinogen, or inhalant). *Data sources:* Effectiveness data: before-after study Resource use estimates: before-after study, the state-wide criminal justice database, the California Alcohol and Drug Data System, the California Department of Health Services databases Unit costs: local sources *Time horizon:* 3 years for outcomes, and 2 years prior and	*Costs:* Mean public sector per-person costs: • 2 years post programme entry: $8,358 • 2 years prior to programme entry: $11,155 • Difference: -$2,797 *Outcomes:* At 3 years, statistically significant improvements on: • Kennedy Axis V Scale • SF- 12 Mental Health Scale • Basis-32 Psychosis, Depression and Anxiety Scale • Basis-32 Impulsive/Addictive Scale • Daily Living Skills Scale on the BASIS-32 • Rosenberg Self-Esteem Scale • Legal status as measured using ASI • CA-QOL At 3 years, there was no difference in: • ASI-Lite • Employment status • Clients' perceived health or medical status Recovery status of service users: • 50% sober • 34% largely recovered with an occasional relapse • 16% still struggling with frequent relapses Consumer satisfaction as measured on BHRS: • Overall score was consistently above the means	*Identified by authors:* poor engagement and associated high attrition; assessment of substance abuse outcomes was problematic; before-after study design; no follow-up of patient dropouts; staff members were used as evaluators; small sample size; limited applicability *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes and relative intervention effects from a before-after study; the estimates of resource use from before-after study, the state-wide criminal justice database, the California Alcohol and Drug Data System, the California Department of	*Source of funding:* California Departments of Mental Health and Alcohol and Drug Programs through a Substance Abuse and Mental Health Services Administration (SAMHSA) Block Grant, and by the San Diego County Health and Human Services Agency Mental Health and Alcohol and Drug Services *Evidence gaps:* no studies of the potential impact of integrated treatment of dual diagnosis in the reduction of public criminal justice and health care costs *Further research identified:* the need for more information as to the effectiveness of integrated programmes; a stage-wise approach to treatment; high frequency of marijuana use and dependence was underdiagnosed by clinicians the impact of this is unknown and worthy of further study; a comprehensive cost study is needed that includes the cost of all physical health, mental health, other drug costs, medications for all conditions, social

							post to programme for costs *Discount rates:* none applied *Perspective:* public sector (healthcare, social care and the criminal justice) *Measures of uncertainty:* statistical analyses	for the normative programme scores The results on the following outcome measures were not reported: • CES-D • Pearlin Mastery scales *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on before-after study	Health Services databases; the unit costs of resources from local sources; no sensitivity analysis	services, housing assistance, and disability insurance benefits, and should address cost shifting

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Lambert MT. Linking mental health and addiction services: a continuity-of-care team model. The Journal of Behavioral Health Services & Research. 2002;29:433-44.	Before-after study with economic evaluation	Partially applicable Very serious limitations [-]	*Country:* US *Setting:* medical centre *Location:* Dallas	Integrated addiction treatment services with general psychiatric care	Pre-programme introduction service users were referred to specialty stand-alone chemical addiction programmes	*Effectiveness data: n*ot reported *Resource use estimates:* not reported	*Type of economic analysis:* cost-effectiveness analysis *Population:* adults with PTSD, mood disorder, or schizophrenia; and who had a co-occurring substance disorder *Data sources:* Effectiveness data: before-after study Resource use estimates: before-after study Unit costs: unclear *Time horizon:* 1 year prior-to and post programme entry *Discount rates: n*ot	*Costs:* Mean annual public sector per-person costs: Prior to the programme entry: $9,409 Post the programme entry: $6,266 Difference: -$3,143 *Outcomes:* Service user satisfaction scores prior and post programme implementation expressed in terms of Z-scores (standardised scores that provide a monitor for a particular site minus the mean of all sites, divided by the standard deviation across all sites): • Staff involvement improved from 0.5 to 0.66 • Overall satisfaction with care improved from 0.58 to 0.67 • Satisfaction Z score compared with all the other sites improved from -0.43 to 0.6 Staff feedback scores prior and post programme implementation: • Access to addiction services	*Identified by authors:* none identified *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes from a before-after study (the size of the study was not reported); the estimates of relative intervention effects from a before-after study; the source of unit costs unclear; no sensitivity analysis	*Source of funding:* unclear *Evidence gaps:* none identified *Further research identified:* none identified

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
							applicable *Perspective:* healthcare payer *Measures of uncertainty:* none	improved from 3.1 to 4.1 • Continuity of care improved from 2.8 to 3.5 • Coordination of care improved from 2.6 to 3.7 *Cost-effectiveness:* integrated addiction treatment dominant option *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on before-after study		

Integrated treatment based on case management – costs analysis

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Jerrell JM. Cost-effective treatment for persons with dual disorders. New Directions for Mental Health Services. 1996:79-91. AND Jerrell JM, Hu TW. Estimating the cost impact of three dual diagnosis treatment programs. Evaluation Review. 1996;20:160-80. AND Jerrell JM, Wilson JL. The utility of dual diagnosis services for consumers from non-white ethnic groups. Psychiatric Services. 1996;47:1256-58. AND Jerrell JM, Ridgely MS. Gender differences in the assessment of specialized treatments for substance abuse among people with severe mental illness. Journal of	RCT with economic evaluation	Partially applicable Potentially serious limitations [+]	*Country:* US *Setting:* mental health agencies *Location:* likely South Carolina	Specialised integrated treatment including (1) intensive case management, (2) behavioural skills In all cases substance abuse (SA) services were delivered within mental health treatment teams or within their mental health agencies. All service users received standard mental health services (medication and counselling).	Standard care (SC) defined as AA/12-Steps integrated treatment In all cases SA services were delivered within mental health treatment teams or within their mental health agencies. All service users received standard mental health services (medication and counselling).	*Effectiveness data:* AA/12-Steps n=39; behavioural skills n=48, case management n=45 *Resource use estimates:* AA/12-Steps n=39; behavioural skills n=48, case management n=45	*Type of economic analysis:* cost analysis *Population:* adults with co-occurring SMI (psychotic or major affective disorder) and SA *Data sources:* Effectiveness data: RCT Resource use estimates: RCT; billing and claims data; criminal justice data systems; and other local sources Unit costs: local mental health authority's management information, billing and claims information, county department cost accounting data, and other local sources *Time horizon: 1*8 months *Discount rates:* none applied *Perspective:* public sector (healthcare, social care and the criminal justice)	*Costs* Mean per-person costs (and percent change in costs compared with baseline) for intensive case management group: • Baseline: $15,774 • 6 months: $14,158 (-10%) • 12 months: $10,637 (-33%) • 18 months: $9,364 (-41%) Mean per-person costs (and percent change in costs compared with baseline) for behavioural skills group: • Baseline: $12,252 • 6 months: $9,509 (-22%) • 12 months: $10,149 (-17%) • 18 months: $10,245 (-16%) Mean per-person costs (and percent change in costs compared with baseline) for AA/12-Steps group: • Baseline: $19,888 • 6 months: $12,628 (-37%) • 12 months: $11,522 (-42%) • 18 months: $12,585 (-37%) *Sensitivity analysis:* Discounting did not significantly alter the results The results were robust to changes in the estimates of informal caregiving and legal costs *Health inequalities impact*: At 6-month follow-up service users from black and minority ethnic groups received significantly less supportive services (costs of supportive services were $4,020 [SD $3,808] and $2,551 [SD	*Identified by authors:* generalizability issues; small samples *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of resource use from an RCT, billing and claims data, criminal justice systems, and other local sources; the unit costs of resources from local mental health authority's management information, billing and claims information, county department cost accounting data, and other local sources; no sensitivity analysis	*Source of funding:* the National Institute of Mental Health *Evidence gaps:* lack of studies examining both the costs and effects of substance abuse interventions for the severely mentally ill; lack of research in terms of need and use of treatment services between men and women *Further research identified:* need for studies identifying approaches that effectively serve dually diagnosed; treatments for personality disorders with substance disorders; additional work is needed to examine interventions for clients with psychotic, characterological, and substance disorders; evaluating other approaches that work efficiently and effectively with dual-disorder service users

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Psychoactive Drugs. 1995;27:347-55.							and informal care *Measures of uncertainty:* none	$2,744] for white and service users from black and minority ethnic groups, respectively). At 6-month follow-up females had a greater reduction in total intensive mental healthcare costs when compared with males (reduction of $2,314 versus $7,685, for males and females, respectively [p≤0.01]). Overall both genders appear to do equally well in these interventions. *Modelling method*: economic evaluation based on RCT		

Integrated treatment based on case management – costs-effectiveness analyses

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Jerrell JM, Ridgely M. The relative impact of treatment program "robustness" and "dosage" on client outcomes. Evaluation and Program Planning. 1999;22:323-30	RCT with economic evaluation	Partially applicable Potentially serious limitations [+]	*Country:* US *Setting:* community mental health centre *Location:* likely South Carolina	Specialised integrated treatment including (1) intensive case management, (2) behavioural skills In all cases SA services were delivered within mental health treatment teams or within their mental health agencies. All service users received standard	Standard care (SC) defined as AA/12-Steps integrated treatment In all cases SA services were delivered within mental health treatment teams or within their mental health agencies. All service users received standard mental health services (medication	*Effectiveness data:* n=132 *Resource use estimates:* n=132	*Type of economic analysis:* cost-effectiveness analysis *Population:* adults with co-occurring SMI (psychotic or major affective disorder) and SA *Data sources:* Effectiveness data: RCT Resource use estimates: RCT Unit costs: unclear *Time horizon:* 24	*Costs:* Mean per-person costs (robust implementation of the service): • AA/12-Steps: $11,752 • Behavioural skills: $9,665 • Case management: $6,375 Mean per-person costs (non-robust implementation of the service): • AA/12-Steps: $6,687 • Behavioural skills: $5,529 • Case management: $7,334 *Outcomes:* Total SAS-II scores (robust implementation of the service): • AA/12-Steps: 74.22 (SD 8.23) • Behavioural skills: 77.03 (SD 10.67) • Case management: 77.44	*Identified by authors:* none identified *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes and resource use from an RCT; the unit costs of resources unclear	*Source of funding:* the National Institute of Mental Health *Evidence gaps:* none identified *Further research identified:* none identified

				mental health services (medication and counselling).	and counselling).		months *Discount rates:* none applied *Perspective: p*ublic sector (healthcare and social care) *Measures of uncertainty:* statistical analyses	(SD 9.08) Total SAS-II scores (non-robust implementation of the service): • AA/12-Steps: 75.05 (SD 11.22) • Behavioural skills: 76.10 (SD 7.48) • Case management: 75.11 (SD 9.37) Total RFS scores (robust implementation of the service): • AA/12-Steps: 11.09 (SD 3.55) • Behavioural skills: 13.30 (SD 4.20) • Case management: 12.84 (SD 4.84) Total RFS scores (non-robust implementation of the service): • AA/12-Steps: 13.52 (SD 3.60) • Behavioural skills: 11.59 (SD 2.76) • Case management: 11.46 (SD 4.03) *Cost-effectiveness:* Robust model costs and outcomes: • Case management dominant when using SAS-II as an outcome measure • AA/12-Steps is dominated by case management and behavioural skills model when using RFS as an outcome measure. • Behavioural skills model (when compared with case management) results in an ICER of $7,152 per additional point improvement on the RFS scale Non-robust model costs and outcomes:		

								• Behavioural skills model was dominant when using SAS-II as an outcome measure • Case management was dominated by AA/12-Steps and behavioural skills when using RFS as an outcome measure • • AA/12-Steps results in an ICER of $600 per additional point improvement on RFS when compared with behavioural skills model *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on RCT		

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Jerrell JM, Wilson JL, Hiller DC. Issues and outcomes in integrated treatment programs for dual disorders. Journal of Behavioral Health Services and Research. 2000;27:303-13.	Before-after study with economic evaluation	Partially applicable Potentially serious limitations [+]	*Country:* US *Setting:* mental health centre *Location:* likely South Carolina	Integrated dual diagnosis day-treatment model with clinical staff from both mental health, and drug and alcohol services. Daily activities included skill-building groups for mental health problems and achieving or maintaining sobriety, 12-Steps group and meetings, relapse prevention skills sessions, and	Standard care (SC) was not defined; however, it is believed that services were not integrated in any way	*Effectiveness data:* n=118; n=203 follow-up *Resource use estimates:* completers n=59, dropouts n=59	*Type of economic analysis:* cost-consequences analysis *Population:* adults with mental illness of schizophrenia, bipolar disorder, or major depression with psychotic features; and who had a co-occurring substance disorder *Data sources* Effectiveness data: before-after study Resource use estimates: before-after study; local authority	*Costs:* Mean public sector per-person costs for completers: • At 6-months prior to programme implementation: $5,004 (SD $4,689) • At 6-months post programme implementation: $2,174 (SD $1,303) • At 12-months post programme implementation: $2,793 (SD $2,210) Mean public sector per-person costs for dropouts: • 6-months prior to programme implementation: $3,954 (SD $4,894) • 6-months post programme implementation: $1,730 (SD $1,532) • 12-months post programme implementation: $995 (SD	*Identified by authors:* small sample sizes; proportion of sample comprised service users with personality disorders; lack of generalizability; lack of control group; short follow-up *Identified by developer:* short time horizon; no consideration of employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of	*Source of funding:* a private foundation in South Carolina, the Department of Alcohol and Other Drug Abuse Services, the South Carolina Department of Mental Health and the University of South Carolina School of Medicine *Evidence gaps:* lack of evidence regarding the type of setting, and the type of therapeutic interventions that would be most effective; lack of information about the issues and strategies employed in designing and implementing integrated treatments

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
				case management.			databases, billing system, other local sources Unit costs: local sources *Time horizon:* 6 months prior and up to 12 months post programme introduction *Discount rates:* not applicable *Perspective:* public sector (healthcare and social care) *Measures of uncertainty:* statistical analyses	$1,075) *Outcomes:* Mean scores on SAS at 6 months prior to programme implementation, 6 and 12 months after (p value refers to comparison across all time points): • Housing stability: 5.08, 5.55, 5.38; p=ns • Social contacts: 19.12, 20.55, 20.50; p=ns • Family relations: 18.13, 19.80, 19.69; p≤0.05 • Work affect: 20.29, 20.45, 20.73; p=ns Mean score on RFS at 6 months prior to programme implementation, 6 and 12 months after (p value refers to comparison across all time points): • 2.00, 2.46, 2.65; p≤0.01 Mean scores on DIS at 6 months prior to programme implementation, 6 and 12 months after (p value refers to comparison across all time points): • Depression: 8.71, 6.23, 7.08; p=ns • Mania: 3.92, 2.86, 3.38; p=ns • Schizophrenia: 5.38, 5.00, 5.77; p=ns Mean scores on CUAD at 6 months prior to programme implementation, 6 and 12 months after (p value refers to comparison across all time points): • Cannabis severity: 1.83, 0.59, 0.00; p=ns • Cocaine severity: 2.04, 1.00, 1.85; p=ns There was no differences on SLS and Client Satisfaction	baseline outcomes and relative intervention effects from a before-after study; only healthcare and social care costs were included; the estimates of resource use from a before-after study; the unit costs of resources from local sources; only some statistical analyses conducted	*Further research identified:* none identified

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
								Questionnaire-8 *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on before-after study		

Other interventions

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
Craig TKJ, Johnson S, McCrone P, Afuwape S, Hughes E, Gournay K, et al. Integrated care for co-occurring disorders: Psychiatric symptoms, social functioning, and service costs at 18 months. Psychiatric Services. 2008;59:276-82.	Cluster RCT with economic evaluation (Johnson 2007) The unit of cluster were case managers.	Directly applicable Minor limitations [++]	*Country:* UK *Setting:* community mental health centre *Location:* London boroughs of Southwark, Lewisham, Lambeth, and Croydon	A 5-day training intervention for staff in assessment and management of dual diagnosis, including delivering integrated care (defined as motivational interviewing and CBT strategies) provided by a single service	Standard care (SC) defined as no training (conventional management by CMHTs; the management of substance abuse (SA) was by referral to a separate substance dependency service; and there was no SA specialist on the team).	*Effectiveness data:* n=228 baseline; n=206 follow-up *Resource use estimates:* n=212	*Type of economic analysis:* cost-effectiveness analysis *Population:* adults with schizophrenia, schizoaffective disorder, or other non-affective psychotic illness or bipolar affective disorder with psychotic symptoms plus SA problem (alcohol and/or cannabis, stimulants, and other drugs) *Data sources:* Effectiveness data: Cluster RCT Resource use estimates: cluster RCT Unit costs: national sources *Time horizon:* 18 months *Discount rates:* none applied *Perspective:* public sector (healthcare, social care and the criminal justice) *Measures of*	*Costs:* Mean public sector per-person costs at 18-months: • Intervention: £18,672 (SD £26,449) • SC: £17,639 (SD £23,266) • Difference: £1,033, (bootstrapped 95% CI; –£5,568; £6,734), p=ns *Outcomes:* Mean scores on BPRS at follow-up: • Intervention: 37.0 (SD 9.8) • SC: 41.6 (SD 11.2) • Adjusted difference: -4.20 (in favour of the intervention), (95% CI: -7.3; -1.2), p<0.001 Mean scores on CANSAS at follow-up: • Intervention: 6.8 (SD 3.4) • SC: 7.5 (SD 3.1) • Adjusted difference: -0.84 (in favour of the intervention), (95% CI: -1.6, -0.04), p=0.04 Mean scores on LSP at follow-up: • Intervention: 121.0 (SD 16.3) • SC: 120.5 (SD 15.8) • Adjusted difference: 1.31 (in favour of the intervention), (95% CI: -2.4; 4.9), p=0.49 Mean scores on MANSA at follow-up: • Intervention: 53.4 (SD 12.1) • SC: 50.0 (SD 12.8) • Adjusted difference: 0.62 (in favour of the intervention), (95% CI: -3.8; 2.9), p=0.79	*Identified by authors:* investigators were not blind to patients' intervention or control group status; substantial attrition; possible contamination between the intervention and comparison groups because participants in the comparison group were working alongside others who had received training; difficulties in separating the effect of training intervention and treatment intervention *Identified by developer:* short time horizon; no consideration of housing needs, employment outcomes, dependence on benefits, and levels of admissions to secure settings; the estimates of baseline outcomes and resource use from an RCT	*Source of funding:* Bethlem and Maudsley National Health Service Trust *Evidence gaps:* lack of head-to-head efficacy data *Further research identified:* test the efficacy of a more potent mix of motivational interviewing and cognitive-behavioural therapy for people with dual diagnosis

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
							uncertainty: statistical analyses	Mean scores on Client Satisfaction Questionnaire at follow-up: • Intervention: 23.5 (SD 6.5) • SC: 23.4 (SD 6.3) • Adjusted difference: -0.99 (in favour of the SC), (95% CI: -3.3; 1.3), p=0.39 Mean scores on TPQ at follow-up: • Intervention: 21.5 (SD 0.8) • SC: 21.1 (SD 0.75) • Adjusted difference: 0.68 (in favour of the intervention), (95% CI: -2.1, 3.5), p=0.62 Mean units of alcohol consumption a day (baseline versus follow-up): • Intervention: 4.8 (SD 7.2) versus 3.5 (SD 5.6); reduction of 1.3 units a day • SC: 7.2 (SD 6.6) versus 4.4 (SD 7.4); reduction of 2.2 units a day • Reductions in alcohol use were not statistically significant The results on the following outcome measures were not reported: • MAP • AUDIT • DALI *Cost-effectiveness:* • £1,230 per additional point of improvement on the CANSAS • £789 per additional point of improvement on the LSP • £1,666 per additional point of improvement on the MANSA • £1,519 per additional point of improvement on the TPQ • SC dominant using the Client Satisfaction Questionnaire as an outcome measure (SC		

Bibliographic reference	Study type	Study applicability and quality	Setting	Intervention	Comparator	Number of participants	Methods of analysis	Results	Limitations	Additional comments
								results in lower cost and better outcome) *Health inequalities impact*: none considered *Modelling method*: economic evaluation based on RCT		

APPENDIX 7 BIBLIOGRAPHY OF EXCLUDED STUDIES FOR RQ 4

	Study	Reason for exclusion
1.	Jerrell JM. Toward cost-effective care for persons with dual diagnoses. Journal of Mental Health Administration. 1996;23:329-37.	Absolute cost figures are not reported.