

**The effectiveness and cost-effectiveness**

**of treatment and child welfare interventions for parents with a substance use disorder in England**

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Abstract

**Background** Parental substance use disorder (SUD)is associated with poor outcomes for parents and their children. There is a paucity of evidence on the types of interventions received by parents with SUD and their effectiveness and cost-effectiveness, especially in England. **Methods** Data from a national administrative database is used to analyse whether sociodemographic characteristics affected the types of interventions parents received and subsequent outcomes, and whether integrated treatment and child welfare support was a more effective or cost-effective option than treatment only, via three interconnected studies: 1) a descriptive and exploratory study of characteristics, 2) a quasi-experimental study on effectiveness and 3) a cost-effectiveness analysis. **Results** Parents are not a homogenous group, with those not living with children appearing to have the most complex support needs in the treatment system. The likelihood of receiving integrated support varied between mothers and fathers, and parents living and not living with children. Parents who received treatment in a residential setting were more likely to complete, and treatment plus parenting and/or family recovery support appeared to be more effective than treatment alone for non-opiate/ alcohol users. Among opiate users, delivery of parenting and/or family recovery support was only associated with better treatment outcomes for fathers not living with their children. Further analysis which focused on parents with an alcohol use disorder suggested that treatment plus parenting and/or family recovery support was cost-effective. **Conclusion** This PhD sets out 14 detailed findings which bring novel evidence together and 10 research recommendations for the field. The strength of this thesis is that it adds to the limited evidence base and provides researchers with replicable techniques to be adopted and adapted in various jurisdictions. Using the recommendations presented, policymakers and decisionmakers can make informed decisions on how best to support families.

Declaration

I am aware of the University’s Guidance on the Use of Unfair Means ([*www.sheffield.ac.uk/ssid/unfair-means*](http://www.sheffield.ac.uk/ssid/unfair-means)). This work has not previously been presented for an award at this, or any other, university. This thesis contains manuscripts that have been prepared for and submitted to journals. I confirm that the work submitted in this thesis is my own except for the chapters 3-5 that are jointly authored manuscripts. Individual author contributions are stated below.

**Chapter 3: Exploring characteristics and interventions of parents receiving specialist treatment and child welfare support services in England.**

**Virginia Musto Wright**: Conceptualisation, Methodology, Software, Formal analysis, Investigation, Data curation, Writing - Original draft preparation **Brian Eastwood**: Methodology, Validation, Visualisation, Writing - Review and Editing **Petra Meier**: Writing - Review and Editing **Alan Brennan**: Writing - Review and Editing, Supervision.

**Chapter 4: Do targeted prevention interventions for families improve alcohol and drug treatment completions among parents with a substance use disorder? A quasi-experimental study using Generalized Boosted Models.**

**Virginia Musto Wright**: Conceptualisation, Methodology, Software, Formal analysis, Investigation, Data curation, Writing - Original draft preparation **Brian Eastwood**: Writing - Review and Editing **Petra Meier**: Writing - Review and Editing **Alan Brennan**: Writing - Review and Editing, Supervision

**Chapter 5: For parents with an alcohol use disorder, is treatment plus parenting and/or family recovery support a more cost-effective option than treatment alone?**

**Virginia Musto Wright**: Conceptualisation, Methodology, Software, Formal analysis, Investigation, Data curation, Writing - Original draft preparation **Alan Brennan**: Validation, Visualisation, Writing - Review and Editing, Supervision.

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Glossary

*Table G 1.1‑1 List of abbreviations commonly used in the thesis*

|  |  |
| --- | --- |
| Abbreviation | Meaning |
| aOR | Adjusted odds ratio |
| ATE | Average Treatment Effect |
| AUD | Alcohol use disorder |
| BCAP | Brief Child Abuse Potential Inventory |
| E | E-value (used in sensitivity analysis) |
| FASD | Foetal Alcohol Spectrum Disorder |
| ICER | Incremental cost effectiveness ratio |
| LWC | Parent living with children |
| NDTMS | National Drug Treatment Monitoring System |
| NHS | National Health Service |
| NICE | National Institute for Health and Care Excellence |
| Non-OU | Non-opiate user |
| NWC | Parent not living with children |
| OHID | Office for Health Improvement and Disparities |
| OR | Odds ratio |
| OU | Opiate user |
| PHE | Public Health England |
| PuP | Parents Under Pressure parenting programme |
| QALY | Quality-adjusted life years |
| SUD | Substance use disorder |
| tpA2A | Transition probability of moving from ‘In treatment’ to ‘In treatment’ (those in treatment only) |
| tpA2B | Transition probability of moving from ‘In treatment’ to ‘In remission’ (those in treatment only) |
| tpA2C | Transition probability of moving from ‘In treatment’ to ‘Not in treatment and not in remission’ (those in treatment only) |
| tpA2D | Transition probability of moving from ‘In treatment’ to ‘Died’ (those in treatment only) |
| tpA2A\_2 | Transition probability of moving from ‘In treatment’ to ‘In treatment’ (those on the intervention) |
| tpA2B\_2 | Transition probability of moving from ‘In treatment’ to ‘In remission’ (those on the intervention) |
| tpA2C\_2 | Transition probability of moving from ‘In treatment’ to ‘Not in treatment and not in remission’ (those on the intervention) |
| tpA2D\_2 | Transition probability of moving from ‘In treatment’ to ‘Died’ (those on the intervention) |
| tpB2A | Transition probability of moving from ‘In remission’ to ‘In treatment’ (those in treatment only) |
| tpB2B | Transition probability of moving from ‘In remission’ to ‘In remission’ (those in treatment only) |
| tpB2C | Transition probability of moving from ‘In remission’ to ‘Not in treatment and not in remission’ (those in treatment only) |
| tpB2D | Transition probability of moving from ‘In remission’ to ‘Died’ (those in treatment only) |
| tpB2A\_2 | Transition probability of moving from ‘In remission’ to ‘In treatment’ (those on the intervention) |
| tpB2B\_2 | Transition probability of moving from ‘In remission’ to ‘In remission’ (those on the intervention) |
| tpB2C\_2 | Transition probability of moving from ‘In remission’ to ‘Not in treatment and not in remission’ (those on the intervention) |
| tpB2D\_2 | Transition probability of moving from ‘In remission’ to ‘Died’ (those on the intervention) |
| tpC2A | Transition probability of moving from ‘Not in treatment and not in recovery’ to ‘In treatment’ (those in treatment only) |
| tpC2B | Transition probability of moving from ‘Not in treatment and not in recovery’ to ‘In remission’ (those in treatment only) |
| tpC2C | Transition probability of moving from ‘Not in treatment and not in remission’ to ‘Not in treatment and not in remission’ (those in treatment only) |
| tpC2D | Transition probability of moving from ‘In treatment’ to ‘Died’ (those in treatment only) |
| WTP | Willingness to Pay |
| UK | United Kingdom |
| UKATT | UK Alcohol Treatment Trial |
| US | United States (of America) |
| 95% CI | 95% confidence intervals |

# Introduction

## Thesis overview

This thesis examines the effectiveness and cost-effectiveness of interventions for parents with a substance use disorder (SUD) in England. It focuses on specialist treatment and interventions which promote and protect child welfare, which are the most common interventions commissioned by English local authorities to help families affected by SUD and to safeguard children.

Specialist treatment for SUD refers to pharmacological and/or psychosocial interventions delivered in a structured way following an assessment of clinical and social support needs. In England, it is mostly delivered in an outpatient setting, however treatment can also take place in a residential, hospital or prison setting. Interventions to promote and protect child welfare typically range from parenting programmes, and similar targeted prevention activities, to statutory involvement such as child protection and children being removed from their caregivers.

While there is significant evidence pointing towards the association of SUD with poor caregiving capacity, child abuse and neglect, there is no international consensus on the best way to intervene, and a dearth of research on the effectiveness and cost-effectiveness of interventions, especially in the English context. It is therefore important to improve understanding of whether the interventions currently being offered to support different types of families are helping them and/or whether resources could be allocated differently to achieve better outcomes.

For this thesis, data from a national administrative database of parents with SUD receiving specialist treatment – the National Drug [and alcohol] Monitoring Treatment System (NDTMS) – is used for the first time to analyse the characteristics of parents living with and not with their children, the types of interventions they receive and their outcomes. This thesis contains three chapters written in journal paper format, each of which include a review of the literature, a detailed methodology, results, discussion and conclusion. Below is an outline of this thesis, by chapter.

**Chapter 1** of the thesis provides background on SUD in terms of its definition, prevalence, global disease and social and economic burden. In addition, the impact parental SUD has on children is discussed and an overview of specialist treatment and child welfare interventions in England is provided. Finally, the key evidence on the effectiveness and cost-effectiveness of interventions to support parents and children affected by parental SUD is set out.

**Chapter 2** provides context for the genesis of this work, discusses its evolution over seven years (including before, during and after the COVID-19 pandemic), and summarises the methodology used in the three interconnected quantitative analyses studies submitted or due to be submitted for publication (chapters 3-5).

**Chapter 3** presents study 1 which was submitted for publication in *Drug and Alcohol Review* and then re-submitted with revisions on the recommendation of reviewers. The study is entitled “Exploring characteristics and interventions of parents receiving specialist treatment and child welfare support services in England”. At the time of writing, confirmation of its publication status had not been received. A national longitudinal observational cohort study was used to estimate the associations between parental status (parent living with child and parent not living with their child) and interventions (treatment only vs treatment plus different types of interventions which promote and protect child welfare: parenting and/or family recovery support, targeted early help, statutory children’s social care servicesin the form of child in need and child protection plans, and children in care). Characteristics and interventions associated with successful completion of treatment were also explored.

**Chapter 4** presents study 2 entitled “Do targeted prevention interventions for families improve alcohol and drug treatment completions among parents with a substance use disorder? A quasi-experimental study using Generalized Boosted Models.” This has been prepared for submission to a journal. Study 2 attempted to mitigate confounding by selection bias by using a quasi-experimental approach to test whether parents were more likely to complete treatment successfully if they received targeted prevention in the form of 1) parenting and/or family recovery support or 2) early help, compared with treatment only.

**Chapter 5** presents study 3 entitled “For parents with an alcohol use disorder, is treatment plus parenting and/or family recovery support a more cost-effective option than treatment only?” This has been prepared for submission to a journal. To estimate cost-effectiveness, a deterministic Markov model was constructed using both a health and public sector perspective. Deterministic and probabilistic sensitivity analyses estimated the sensitivity of key assumptions and the level of uncertainty.

**Chapters 6 and 7** are the discussion and conclusion chapters respectively. Key findings are discussed and considered in the context of previous studies in this area. Methodological strengths and limitations are presented, as are recommendations and implications for future research, policy and practice.

## What is meant by ‘substance use disorder’?

The most recent version of American Psychiatric Association’s Diagnostic and Statistical Manual of Mental Disorders is the fifth edition, text revision, or DSM-5-TRTM (APA, 2022). It refers to substance use disorder (SUD) as a pattern of pathological behaviours related to substance use, which can range from a mild disorder to a severe form comprising multiple relapses and compulsive alcohol or drug taking. There are 11 identified associated criteria, referring to when a person experiences the following symptoms:

*Impaired control*

1. Wanting to cut down or stop taking substances but is unable to
2. Spending a lot of time obtaining, using and/or recovering from substances
3. Spending almost all of their day on activities which revolve around substances
4. Possessing strong urges, or cravings, to use substances

*Social impairment*

1. Unable to meet obligations at work, school or home because of substance use
2. Continues using substances despite it causing or exacerbating relationship problems
3. Withdrawing from social, work or recreational activities because of substance use

*Risky use*

1. Continuing to use substances in physically hazardous situations
2. Continuing to use substances despite it causing or exacerbating physical/ psychological problems

*Pharmacological*

1. Tolerance of substances
2. Withdrawal symptoms from substances

While the DSM-5-TRTM acknowledges nicotine as a class of drug linked to SUD, for this thesis I am only concerned with substances included in the following classes: alcohol, opiates (e.g. heroin, methadone, codeine) and non-opiates (e.g. cannabis, cocaine, benzodiazepines) as defined in the Reference Data for the English National Drug Treatment Monitoring System (NDTMS) (OHID, 2023c), and it is these to which I am referring when using the term ‘SUD’ throughout this thesis. This classification reflects how official government statistics on SUD in England are typically reported (OHID, 2023d).

## Prevalence of SUD

According to the United Nations Office on Drugs and Crime (UNODC), in 2021, 296 million people across the globe used drugs and 39.5 million had a drug use disorder, or 0.79% of the adult population (UNODC, 2023). In England, recent prevalence estimates of SUD exist for alcohol users, as well as opiate (e.g. heroin) and/ or crack cocaine users. In 2019 to 2020, alcohol use disorder had a rate of 13.8 per 1,000 population (OHID, 2024). During the same period, opiate and/or crack cocaine users had a rate of 8.9 per 1,000 population (OHID and UKHSA, 2023).

Some notable attempts at estimating prevalence of parental SUD and the number of children affected in England have been made. Using secondary analysis of the 2004 British Crime Survey for England and Wales and the 2000 National Psychiatric Morbidity Survey, Manning et al. (2009) estimated 705,000 children to be living with a parent with an alcohol use disorder and 335,000 with a parent with a drug use disorder. The Office of the Children’s Commissioner for England used the 2014 Adult Psychiatric Morbidity Survey (APMS) as the basis for their approach to modelling prevalence and estimated 472,000 children to be living in a household where a randomly-selected adult has SUD (Office of the Children's Commissioner for England, 2019). This differs to the number of children living with an adult with SUD, and as such represents conservative estimates.

More recently, the Office for Health Improvement and Disparities (OHID), part of the Department of Health and Social Care, published estimates for the number of adults living with children with opiate and/or crack cocaine and alcohol dependency (OHID and The University of Manchester, 2024). Estimates were developed using three data sources: the 2014 APMS, the NDTMS and the census 2011.

In 2019 to 2020, around 121,000 adults living with children were estimated to have an alcohol dependency, or 2.7 per 1,000 population and around 223,000 children were estimated to be living with an adult with an alcohol dependency. Estimates by sex suggest that 3.7 per 1,000 men lived with children compared with 1.8 per 1,000 women (n= 81,069 and 40,160 respectively).

In the same year, around 66,700 adults living with children were estimated to use opiates and/or crack cocaine, or 1.9 per 1,000 population and around 125,000 children were estimated to be living with an adult with an opiate and/or crack cocaine dependency. Prevalence estimates by sex suggest that 2.6 men with an opiate and/or crack cocaine use dependency per 1,000 men in the general population lived with children compared with 1.2 per 1,000 women (n= 45,496 and 21,163 respectively).

While the available data is helpful in providing some insight into the scale of the problem, it is limited for several reasons. First, estimates of ‘adults living with children’ is not the same as estimates of ‘parents’ or even ‘carers’ as it is possible for an adult to live in the same household as a child but not have any caregiving responsibility for that child. Similarly, ‘men’ and ‘women’ living with children may not necessarily correspond to ‘mothers’ and ‘fathers’ or ‘female carers’ and ‘male carers’.

Secondly, the available estimates do not consider parents not living with their children. A parent may not be living with their children for a variety of reasons. For example, because of a relationship breakdown such as divorce resulting with the child living with the other parent, the parent may be in prison, the parent is not permitted to see the child via a no contact order, the child has been taken into care, the child is living with kinship carers, e.g. grandparents, or the child is 16 and has chosen to live outside of the parental household. While there may be more child safeguarding risks associated when a parent living with a child has an SUD, children can be adversely affected by any alcohol or drug using parent, with whom they have regular, infrequent or even non-existent contact. For example, some studies have suggested that some children experiencing both parental alcohol use disorder and parental separation are at greater risk of developing problems with alcohol themselves in adulthood (Thompson et al., 2013; Windle & Windle, 2018).

Thirdly, the most recent estimates published by OHID centre on opiate and/or crack cocaine and alcohol dependency only. This leaves a large gap in estimates for non-opiate users. The latest statistics of adults in treatment in England report that 18.9% of parents were non-opiate only users (n=8224) in 2022-23 (OHID, 2023a). What is unclear is the prevalence among those not in treatment.

Further, there will be many more children than those estimated living with a parent whose substance use does not meet the threshold of dependency who will be adversely affected. For example, in a rapid evidence assessment of the association between adverse child outcomes and non-dependent parental substance use, McGovern et al. (2020) found strong evidence of an association with externalizing difficulties and substance use among adolescent children, and some evidence supporting adverse health outcomes in early childhood.

Finally, the adverse experiences of children of parents with SUD is sometimes referred to as ‘Hidden Harm’ in England (Advisory Council on the Misuse of Drugs, 2003), reflecting that the harm experienced by these children is typically either hidden or negligently not recognised as harm. The nature of hidden harm means it can be difficult to estimate the prevalence of parental SUD. This is compounded by the stigma associated with parental SUD, particularly maternal SUD, which can prohibit parents and their children from seeking or receiving support (Page et al., 2024; Whittaker et al., 2020) and therefore not presenting in datasets used to estimate prevalence.

Given the limitations in prevalence estimates described above there is a strong case for the use of large datasets, such as the NDTMS, to better understand the characteristics of the parent with SUD population in England, including, but not limited to, differences between mothers and fathers, child living arrangements and types of substance used by parents.

## Impact of parental SUD on children

The adverse impact parental SUD can have on children is well documented.

For example, there is a strong association between parental SUD and children exhibiting internalising and externalising behaviours, such as anxiety and depression, conduct disorder and oppositional defiant disorder (Kendler et al., 2013; Ohannessian, 2012; Seay, 2020; Staton-Tindall et al., 2013; Torvik et al., 2011).

In addition, children whose parents use alcohol and/ or drugs are more likely to experience negative educational outcomes, such as lower attendance and educational attainment, and poorer concentration levels (Díaz et al., 2008; Evans et al., 2020; Gifford et al., 2015; Raitasalo et al., 2020). However, for some school can be a protective factor with one review highlighting that many studies have not been able to distinguish between differences in enjoyment between children with parents with SUD and children whose parents did not have SUD (Lowthian, 2022), perhaps a result of schools being a safe and stable environment for children with positive adult role models and influences whose homelife may be more chaotic.

There is also an association between parental SUD and children experiencing health harms, with one study of alcohol use among caregivers suggesting that it may contribute to higher risk of unintentional, and more severe, childhood injuries (Damashek et al., 2009). Parental SUD is also linked to an increased risk of early onset of substance use among children and SUD in adulthood (Cleaver et al., 2011; Velleman & Templeton, 2016).

Further, findings from a rapid review suggest that harms associated with parental substance use can occur at a lower ‘non-dependency’ diagnostic threshold (McGovern et al., 2020). Finally, parental SUD rarely occurs as an isolated problem; research into child protection cases and deaths suspected to be caused by maltreatment, show the prominence of parental SUD and its co-occurrence with parental learning disabilities, mental ill health, domestic abuse and poverty (Brandon et al., 2020; Cleaver et al., 2011; Sidebotham et al., 2016b), with children sometimes continuing to face adverse experiences and associated negative behavioural, health and social outcomes in adulthood (Bellis, Lowey, et al., 2014; Cleaver et al., 2011; Hughes et al., 2017).

### Parent-child relationships in the context of SUD

SUD can adversely affect relationships between a child and their primary care giver, known as parent-child dyads. Positive parent-child dyads are important as they promote 1) a healthy brain and nervous system from foetus to young adulthood, which impacts future emotional, behavioural and cognitive development and wellbeing (neurodevelopment), 2) strong emotional bonds (attachment) and 3) concordance between parent and child, with the primary caregiver acknowledging and responding to their child’s needs (attunement) (Cooke et al., 2019; Health & Medicine Policy Research Group, 2018; Ilyka et al., 2021).

Poor parent-child dyads are associated with increased risk of child abuse and neglect, or ‘child maltreatment’ (Stith et al., 2009). In a systematic review and meta-analysis of mother-infant dyads, Hatzis et al. (2017) found that maternal attachment and attunement were significantly lower among mothers using illicit drugs compared with non-users. Slesnick et al. (2014) observed that in terms of parenting skills and maternal-child dyads, mothers with an opioid, alcohol or cocaine use disorder generally struggled, with alcohol using mothers appearing to struggle the most. Among fathers, substance use generally is associated with poor dyads in terms of relationship tensions, hostility, aggressiveness and child maltreatment (Lee et al., 2021).

A recent study compared the results of brain activity (via functional magnetic resonance imaging) and personal feelings and thoughts while seeing infant [faces](https://www.sciencedirect.com/topics/neuroscience/face) and [hearing](https://www.sciencedirect.com/topics/neuroscience/sensation-of-hearing) infant cries between mothers who used substances during the perinatal period and mothers who did not. The researchers found that maternal substance use was associated with less affective empathy (i.e. the ability to share the feelings of the infant) without any personal direct emotional stimulation (McCurdy et al., 2024). However, ascertaining whether differences in responses were associated with differences in caregiving abilities was beyond the scope of the study.

In her content analysis review of five UK- and two US-based studies of how parental substance use can affect children, Kroll (2004) identified six themes affecting relationships:

1. ‘Denial, distortion and secrecy’: families not discussing or acknowledging the ‘elephant in the room’ which can lead to separation from wider family members and the community.
2. ‘Attachment, separation and loss’: parents not being dependable or approachable potentially leaving children to feel abandoned; children losing self-worth, and parents temporarily being lost due to incarceration or family court proceedings.
3. ‘Family functioning, conflict and breakdown’: parental conflict was experienced by all families in the study causing stress and, in some cases, separation.
4. ‘Violence, abuse and living with fear’: violence by substance users, particular those with alcohol use disorder, was common in the families, causing fear in children.
5. ‘Role reversal, role confusion and the child as a carer’: children having to look after their parents places a heavy toll on their lives and their resilience increases the likelihood of them slipping through the net of statutory child welfare support.
6. ‘What children said they needed’: children needing support, both during periods of parental substance use and after recovery to help them adjust.

Such findings are not uncommon. Interviews with adult family members of people with SUD in three cultures (Mexico, England and indigenous communities in Australia) provided qualitative evidence that children growing up in such households with parental SUD experienced stress, depression and great concern for their parent. Participants also reported school work being affected and children being left hungry (Orford et al., 2005).

#### Child maltreatment

There are four generally recognised types of child maltreatment (Butchart & Harvey, 2006):

1. Physical abuse
2. Sexual abuse
3. Emotional or psychological abuse
4. Neglect

Child exposure to domestic abuse can also be considered maltreatment (WHO, 2016).

The term ‘neglect’ is multifaceted. In the UK, it is defined as:

*The persistent failure to meet a child’s basic physical and/or psychological needs, likely to result in the serious impairment of the child’s health or development. Neglect may occur during pregnancy as a result of maternal substance abuse….*

(HM Government, 2018, p. 104)

Examples include repeatedly not engaging with babies and children and/ or avoiding or forgetting to feed or wash them.

It is important to acknowledge that not all children of parents or carers (hereafter ‘parents’) with an SUD experience child maltreatment. For example, Taplin and Mattick (2013) found that one-third of children of mothers on a methadone maintenance programme, never required an intervention from statutory child welfare services. However, the association between parental SUD and poor parenting places children at risk of harm (Stith et al., 2009) with parenting capacity potentially changing intermittently as the intensity of substance use changes over time (Barnard & McKeganey, 2004). Kepple (2018) observed that parental substance use does not universally indicate risk of frequent child maltreatment, that the risk of abuse is different from that of neglect and that risk varies across different substance using behaviours.

Various social and environmental factors coupled with parental substance use can affect child maltreatment risk. The risk of child maltreatment committed is increased by the presence of other problems such as mental health or domestic abuse (Lutman & Farmer, 2013; Taylor et al., 2008), whether the children belong to a lone parent household or whether one or both parents are using substances (Kroll & Taylor, 2003). A rapid evidence assessment by Canfield et al. (2017) found many factors to be associated with mothers who use substances having their children removed from their care as a result of abuse or neglect. These included: being involved with the criminal justice system, cooccurring mental health problems, having adverse childhood experiences, injecting drugs, lack of engagement with specialist treatment and lack of social support.

‘Adverse childhood experiences’ – maltreatment and household dysfunction during childhood including parental SUD – typically co-occur. Adverse childhood experiences are associated with a significant increased risk of many adverse outcomes in later life, including future problems with substances, unplanned teenage pregnancy, early sexual activity, domestic abuse, and imprisonment (Bellis, Hughes, Leckenby, Perkins, et al., 2014).

Significant associations supporting the theory of intergenerational transmission of SUD have been observed in longitudinal US studies of three generations of substance users (Knight et al., 2014; Neppl et al., 2020). With many parents with SUD also being children of parents with SUD, it is perhaps not surprising that many have themselves experienced child abuse or neglect (Pajulo et al., 2006) and that many do not have the necessary skills to form positive parent-child dyads with their children. In a meta-analysis, Madigan et al. (2019) found that parents who themselves experienced child maltreatment were more than twice as likely to abuse or neglect their own children, although effect sizes were small to moderate. Studies of mothers with SUD in the US and Australia have found significant relationships between a history of physical or sexual abuse and current statutory child welfare involvement, pointing to intergenerational continuity of child abuse among parents with SUD (Grella et al., 2006; Taplin & Mattick, 2013). Given the evidence of intergenerational transmission of SUD and child maltreatment, it may be difficult to break the cycle unless the support needs of the parents and children are addressed by appropriate, effective and timely interventions.

### Resilience

While the likelihood of developing substance problems is increased if a parent has SUD, the relationships between parental SUD and children developing SUD in adulthood is a complex one. Families are unique and so adverse child outcomes are not necessarily generalisable (Velleman & Templeton, 2016). Most children of parents with drinking problems, for example, do not themselves become problem drinkers (Velleman & Orford, 2001). It is possible that the impact of growing up in a household with parental SUD acts as a powerful deterrent (Cleaver et al., 2011). Further, many children who go grow up in parental SUD households go on to become well-functioning and contented adults. Studies often refer to this phenomenon as ‘resilience’.

There is no universal definition of ‘resilience’ (Ahlborg et al., 2024) According to the WHO, the term ‘resilience’ describes individual (and community) positive outcomes despite the occurrence of negative events. Both Health 2020 – the WHO health policy framework for European countries – and the United Nations Sustainable Development Goals have identified resilience as a priority for health and wellbeing, with the term becoming a buzzword used frequently by academia, businesses and the public sector alike (Ziglio, 2017). ‘Resilience’ in the children of parents with SUD typically refers to coping strategies, protective factors and the absence of symptoms or substance use risk behaviour (Ahlborg et al., 2024). Resilience, can, in part, be explained by genetics. Park and Schepp (2015) identified that the brains of ‘resilient’ children of fathers with an alcohol use disorder were observed to have a more active orbital frontal gyrus (OFG) and left insula than their ‘vulnerable’ peers. These are associated with regulating emotions and behaviour.

In a seminal study of British adults aged 16-35 who were the children of parents with an alcohol use disorder, Velleman and Orford (2001) found that many of the children were resilient. In a review of the literature on resilience, Velleman and Templeton (2007) argued that resilience should not be considered as fixed, but rather as a process which can be influenced by social context. Protective factors, such as parental attachment and emotional support from other adults outside of the home, make it far more likely that a child can demonstrate resilience. However, both stable and unstable factors can change over time, and, for example, a child who may be assessed as resilient at one stage in their life, may not continue to be in future.

The idea of ‘resilience’ while useful, can be problematic. Much of the literature aligns a child’s resilience with their behaviour (Todman, 2021). For example, trauma-exposed children who do not use drugs and do well at school are labelled as ‘resilient’. From an early age, trauma-exposed children begin to develop the coping skills needed to recover (Hornor, 2017), but these skills can be to the detriment of the child’s overall wellbeing. For example, children may withdraw socially and adopt avoidance strategies as an act of self-preservation during particularly difficult times where external support is absent (Ahlborg et al., 2024). Similarly some children may become adept at hiding how they have been adversely affected and/or making decisions which take them outside of the home, particularly if the home is chaotic and/or unsafe, thereby potentially putting themselves at increased risk (Ofsted et al., 2018). These examples may come across as ‘poor’ individual resilience but are in fact strategies of survival (Ahlborg et al., 2024). The act of hiding how children are being affected may make them seem resilient and not in need of additional external support. Furthermore, labelling children as ‘resilient’ or not, detracts from the reality that children of parents with SUD are victims while focusing responsibility on the child to cope with and manage their situation, rather than responsibility on adults to safeguard them (Todman, 2021).

## Social and economic burden

SUD causes harm to the individual, their family and concerned others and wider society. Alcohol and drug use disorders are significant contributors to global disease burden measured in disability-adjusted life years (Degenhardt et al., 2018; Griswold et al., 2018). Alcohol and drug use impose substantial social and economic burden associated with crime, health care, lost productivity and other costs (Barrio et al., 2017; Laramée et al., 2013; Manthey et al., 2021).

Parental alcohol use and drug use experienced in childhood was associated with annual costs of £17 billion and £9.3 billion respectively in adulthood from lost productivity (due to premature death or morbidity) in England (Hughes et al., 2020). Furthermore, parental drug use disorder is associated with conduct disorder among their offspring (Anderson et al., 2023). Excess annual costs associated with conduct disorder in childhood is thought to be around £5,500 per child in 2017/18 prices falling to the education, health and social care sectors (Gutman et al., 2018).

Table 1.5‑1 shows examples of excess costs likely to be associated with parental SUD. Given the risk of intergenerational SUD, those experienced by parents may be observed later in life by their adult children. Direct costs refer to resources diverted towards addressing parental SUD from other productive uses. Indirect costs relate to either resources being unavailable for productive use, e.g. unemployment, or insurance costs related to crime. Intangible costs represent disease burden, rather than resource loss, often quantified as disability-adjusted life years (DALYs) or quality-adjusted life year (QALY) losses.

The likely costs associated with categories like ‘homelessness’ and ‘education’ will overlap with other categories.For example, children who experience homelessness have a 25% higher risk of serious illness/ disability than children who do not, and so are more likely to need medical resources (PwC, 2018), as well as other costs associated with poor mental health (otherwise captured in medical resources), wellbeing and lifetime unemployment. The annual cost of child homelessness is estimated to be £33,000 per child in 2020/21 prices. Similarly, children who are expelled from school are estimated to cost an annual £12,700 per child in 2020/21 prices from provision of alternative education, as well as excess health and social care costs (Musto Wright, 2021).

Literature on social and economic costs associated with parental SUD typically focus on the effect of substance use during pregnancy on the foetus. For example, in a US study comparing newborns with Neonatal Abstinence Syndrome (NAS) with non-NAS newborns, Corr and Hollenbeak (2017) found that the costs of additional intensive treatment and longer stays in hospital were nearly $316 million in 2012. In a systematic review and meta-analysis of costs associated with foetal alcohol syndrome disorder (FASD), Greenmyer et al. (2018) found 32 mostly North American (n=29; 20 US and 9 Canadian) studies reporting costs of health care, special educational needs, residential care, criminal justice, productivity losses and loss of quality-adjusted life years (QALYs). Despite methodological differences among the studies, the authors estimated an average cost per annum for children with FASD was approximately $23,000 and, for adults, $24,000.

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*Table 1.5‑1 Examples of sources of costs associated with parental SUD*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Theme | Parental costs | | | Child costs | | |
| *Direct* | *Indirect* | *Intangible* | *Direct* | *Indirect* | *Intangible* |
| Health | Medical and ambulance services  Prescriptions  Mental health treatment  SUD treatment |  | Disability-adjusted life years/ quality-adjusted life years (QALY) losses | Medical and ambulance services  Prescriptions  Mental health treatment  SUD treatment  Costs associated with FASD |  | Disability-adjusted life years/ quality-adjusted life years (QALY) losses |
| Social care | Parenting Programmes  Family court | Kinship care |  | Statutory plans  Foster care  Adoption | Being a young carer |  |
| Education |  |  |  | School exclusion and truancy |  |  |
| Criminal justice | Prison, police and court costs  Probation costs | Insurance costs  Defensive expenditure | Physical and emotional impact of being a victim of crime (QALY losses) | Youth offending costs |  |  |
| Employment |  | Lost productivity |  |  |  |  |
| Homelessness | Housing services |  |  |  |  |  |

## Interventions to support parents and children affected by parental SUD

It is important to understand the types of interventions commissioned, before estimating their effectiveness or cost-effectiveness to improve our understanding on interventions aimed at supporting families and reducing prevalence and costs.

### Specialist treatment for SUD

In England, specialist treatment, hereafter ‘treatment’ refers to pharmacological and/or psychosocial care delivered according to a regularly reviewed recovery care plan. It should follow a comprehensive assessment of not just clinical, but also wider social needs. Treatment usually takes place in an outpatient treatment clinic, hospital, residential unit or prison (Public Health England, 2019).

Pharmacological interventions refer to the dispensing of medication to patients for medically assisted withdrawals, and more commonly for preventing and managing withdrawal symptoms, reducing cravings and consumption of substances or preventing relapse (Department of Health, 2017; OHID, 2023b).

Psychosocial interventions refer to a wide range of approaches directed at psychological change (ranging from simple motivational interviewing techniques delivered by a keyworker to structured psychological methods such as cognitive behavioural therapy delivered by a therapist) and/or social change (e.g. social skills and vocational training). In cases where a pharmacological intervention is a fundamental part of a substance user’s recovery care plan, e.g. among heroin users, psychosocial interventions should be offered alongside pharmacological interventions (Department of Health, 2017).

Globally, one in 5 people with a drug use disorder were thought to be in treatment in 2021, with opioids being the most common reason for people accessing treatment in Africa, America and Europe, compared with amphetamine-type stimulants elsewhere (UNODC, 2023). It is estimated that globally fewer than 1 in 5 people with an alcohol use disorder receive treatment (Mekonen et al., 2021). In comparison in 2019 to 2020 in England, over 1 in 3 people using opiates and/or in crack (42%) and over 1 in 5 people (22%) with an alcohol use disorder were in treatment. Similar proportions were found for adults living with children in treatment (opiates and/or crack = 47%, and alcohol = 24%) (OHID and The University of Manchester, 2024).

#### Barriers to engagement with treatment services

Barriers to engagement with treatment services are numerous and wide-ranging. In their review of systematic reviews, Farhoudian et al. (2022) classified barriers to SUD treatment into three levels: individual (n=21), social (n=19) and structural (n=37). Individual barriers included a belief that treatment was not necessary/ preference to stop taking drugs/ drinking on their own, fear of stigma, being arrested, and/or withdrawal, comorbid mental health problems. Social barriers included stigmaand lack of social support, family/ friends networks, problems related to treatment services, e.g. lack of trained/ supportive staff. Structural barriers included no consideration of contextual factors/ failure to assess and address holistic support needs such as housing/ employment. While most barriers were structural, and it is possible that a focus on structural barriers (and facilitators) may yield positive results that in turn affects social and individual levels as the authors suggest, it is not possible to assess which barriers were the most influential in a person’s decision to engage with treatment or not.

What the evidence does suggest, however, is that in addition to the above, parents, particularly mothers, and pregnant women, face unique barriers such as fear of being accused of child abuse and having their children taken into care and lack of childcare facilities for those that live with their children. Contextual factors such as reporting substance use to children’s social care can also be a barrier to getting support (Choi et al., 2022).Parents with SUD face particular stigmatization and feelings of shame from having an SUD *and* being a parent, with mothers likely to experience stigma and shame more deeply than fathers as they may be perceived as contravening their roles as mothers (Gunn & Miranda Samuels, 2020; Long & Jepsen, 2023; McGovern et al., 2022; Radcliffe, 2011).

### Targeted prevention

In addition to care planned treatment, recovery support interventions play a key role in supporting people throughout their treatment journey, as well as their recovery journey after treatment, by providing emotional and practical support. Some people never engage with treatment services opting instead to use peer-based and other recovery support services, such as Alcoholics Anonymous (OHID, 2023b).

‘Recovery support’ as it is referred to in the English treatment sector can be thought of as targeted prevention aimed specifically at people with SUD or in recovery, which aims to build their skills, resilience, and ability to make positive decisions about their wellbeing, and that of their loved ones. It is based on the theory of recovery capital – the internal and external resources that a person has and can use to achieve or sustain their recovery from SUD (Cloud & Granfield, 2008). The more resources a person has, the more likely they are to achieve recovery, even ‘natural recovery’ which occurs without a treatment intervention (Granfield & Cloud, 2001). Family support networks can play an important role in an individual’s recovery and thus their recovery capital (Best & Hennessy, 2022; Copello et al., 2005; Granfield & Cloud, 2001), but a person’s recovery is not the responsibility of their family and affected family members may require therapeutic support in their own right.

Parents should be able to access a wide range of targeted prevention from within the treatment system to enhance their recovery capital, from support with housing and employment to activities specific to improving parenting skills and familial relationships (known as ‘parenting and/or family recovery support’). Another form of targeted prevention is ‘early help’ provided by children and family services (viz. children’s centres or Family Hubs) which are a level above universal access to ‘early help’ and below the threshold of statutory children’s social care such as child protection (Children's Commissioner, 2024).

While the NDTMS records targeted prevention activities, this data is hitherto not publicly available. The Association of Directors of Children’s Services estimated that on 31 March 2022, there were 185,100 children in targeted early help services (Children's Commissioner, 2024). It is not possible to know how many of these were parental SUD-related.

### Statutory children’s social care services

Statutory child welfare services under children’s social care are managed by child social workers and encompass safeguarding assessment, case management and child protection investigations. In England, whether a child receives support from statutory children’s social care is determined by both operational and legal thresholds (Hood et al., 2024).

If a child is disabled or their development is likely to be impaired or unlikely to be achieved or maintained without intervention, they are classified as a ‘child in need’ under section 17 of the Children Act 1989. Interventions provided vary according to safeguarding risk. If there is no current risk of child maltreatment, a child may be put on a child in need plan, whereas in cases of current or likely future child maltreatment, the child may be put on a child protection plan following a child protection conference under section 47. In extreme cases the child may be removed from their caregivers and placed into care (HM Government, 2018, 2023; Hood et al., 2024)

Substance use may be the sole reason parents are in contact with statutory children’s social care, or there may be corresponding issues that require support, such as domestic violence. More than one issue present within a family is thought to create a cumulative risk of harm to the child and such families are more likely to be known to services (Canfield et al., 2017; Sidebotham et al., 2016a).

In 2022 to 2023, there were around 508,000 assessments under section 17 of the Children Act 1989 with various safeguarding factors identified at the end of each assessment. Of these, 13.2% were recorded as parental drug use being a factor (increasing to 16.2% to include any adult) and 14.1% as parental alcohol use (increasing to 16.3% to include any adult) (DfE, 2023). It is not possible to know the breakdown of child in need plans, child protection plans or children being placed in care from this or other official statistics. Moreover, as the Children's Commissioner (2024) points out, statutory guidance allows for every local authority to establish their own thresholds for child welfare interventions. This means a child experiencing parental SUD may be assessed as a child in need in one local authority, while a child with identical circumstances may be referred for targeted prevention in another.

### Summary of support available to children and families affected by parental SUD in England

*Table 1.6‑1 Statutory and non-statutory support*

|  |  |
| --- | --- |
| **Intervention** | **Threshold** |
| Specialist treatment | Available to anyone with alcohol and/or drug problems. No legal requirement to attend unless mandated to do so by a court in lieu of a prison sentence/ children being placed in care. |
| Targeted prevention:  Targets early help; parenting and family recovery support | A level above universal access to ‘early help’ and below the threshold of statutory child welfare interventions such as child protection (Children's Commissioner, 2024). These can be provided by treatment services or children and family services in the local community. |
| Statutory children’s social care services for children on a child in need or child protection plan, or in care | Children assessed as in need receive statutory services to support their health and development but no protective interventions, unlike those on a child protection plan where there is concern of significant harm. Some children may require an episode of out-of-home care, either by a consensual parental arrangement or court mandate (Hood et al., 2024). |

### Working together

*Working together to safeguard children* is the statutory guidance for protecting and promoting child welfare and applies to all organisations and agencies who work with children, including targeted prevention and statutory children’s social care(HM Government, 2018, 2023). The guidance also covers services for adults who may be responsible for children, such as treatment services, and specifies that these are subject to the duties outlined in section 11 of the Children Act 2004 whereby practitioners, agencies and organisations must take measures to ensure that they safeguard children, such as asking whether there are children in the family and responding appropriately if children need protecting and/or are taking on caring responsibilities for the adult. The guidance also emphasises the importance of multiagency collaboration and information sharing. Such steers are also present in clinical guidelines for alcohol and drug treatment (Department of Health, 2017; OHID, 2023b).

However, the evidence suggests that these guidelines are not being routinely applied, if at all. A key finding noted from an inspection of neglect among those aged 7-15 in England, was the inconsistency of adult treatment services identifying patients as parents (Ofsted et al., 2018). Treatment services were criticised for not sharing information about parents with child social workers and for focusing too much on the parent without consideration as to how their behaviour might impact the child. The authors stressed that these issues had already been identified in previous inspections (2013 and 2014). Similar findings were reported in a recent report by the National Society for the Prevention of Cruelty to Children (NSPCC) on local child safeguarding case reviews which featured parental substance use. The report highlighted several failings on the part of child social workers and adult treatment practitioners, such as a lack of understanding among child social workers of substance use and its effect on parenting, treatment staff not adhering to their duties under Section 11 of the Children’s Act 2004 and asking whether there are children in the family, and a lack of information sharing between statutory child welfare and treatment services (NSPCC, 2023).

The scientific literature shed some light on possible reasons for the failure of services to work together. Taylor and Kroll (2004) interviewed 40 child social workers, treatment practitioners and other professionals in London and the Southwest of England working with parents using substances. Interviewees reported inconsistent recording and monitoring of caring responsibilities owing to the fear of parents disclosing their substance use in case it resulted in their children being placed in care, and the workers fear of losing their trust. Itäpuisto (2014), in her qualitative analysis of 17 treatment practitioners in Finland highlighted that whether a patient was a parent was recorded merely as background information. Instead, workers focused on the needs of the service user in front of them, and that this was compounded by organisational management policy and practice. In a review of social care support and recovery from SUD, Galvani and Forrester (2011) found several reasons explaining why services do not routinely collaborate, which included the lack of resources, competing professional objectives, and a self-declared lack of skill to address issues of substance use among child social workers and to address issues of child safeguarding among those working with adults.

Furthermore, as Schaeffer et al. (2013) point out, the lack of service collaboration and care management mean that some support offered may be duplicated while other support needs are missed entirely. This may serve to “frustrate families, impede engagement, and hinder the effectiveness of each component”. The lack of coordination between treatment and children’s social care is particularly concerning, given the potential impact on safeguarding decisions and child outcomes.

There is evidence to suggest that years of disinvestment in both treatment and children and family services have exacerbated problems prohibiting the effectiveness of support given to families, including joint working as well as provision of beyond treatment as usual interventions, such as parenting and/or family recovery support. High caseloads and having to prioritise the most complex cases as a result of prolonged funding cuts have made providing individually tailored support to families challenging (Black, 2021; McAllister, 2022; Murphy, 2023; Roscoe et al., 2021).

The literature and reviews of practice highlight a failure of adult treatment services and child welfare services in working together effectively. This failure impedes our understanding of the true scale of parental SUD and the number of children affected, as well as potentially impeding recovery among parents and improving the outcomes of their children.

## The effectiveness and cost-effectiveness of interventions to support parents, children and families affected by parental SUD

The evidence suggests that treatment for adults with SUD is effective and cost-effective (Burkinshaw et al., 2017; Burton, Henn, Lavoie, O'Connor, et al., 2016; Burton, Henn, Lavoie, O’Connor, et al., 2016; Department of Health, 2017; NICE, 2011), but the extent to which this is true of treatment assigned to parents with SUD, and where effectiveness or cost-effectiveness could be improved is not clear. While parents are a subset of the adult treatment population, their support needs differ from non-parents in treatment. For example, parents with SUD face particular stigmatization and feelings of shame from having an SUD *and* being a parent, which can impede recovery, with mothers likely to experience stigma and shame more deeply than fathers (Gunn & Miranda Samuels, 2020; Long & Jepsen, 2023; McGovern et al., 2022; Radcliffe, 2011). Mothers who use drugs are more likely to have their children removed from their care than those who do not (Darlington et al., 2023). Child removal increases trauma and the risk of substance use, depression and suicidal ideation (Alrouh et al., 2022; Broadhurst & Mason, 2020; Crawford et al., 2009; Darlington et al., 2023). Also, financial pressures and housing instability may be more urgent and felt more strongly among parents with SUD who are having to look after their children as well as themselves.

### UK Government funded programmes

In recent years there have been some notable UK Government funded programmes, aiming to improve outcomes for families in England which may be experiencing issues of parental SUD. For example, the Family Intervention Projects (FIPs) and the Supporting Families (formerly Troubled Families) programme are Government interventions targeting English families with multiple support needs, which often (though not necessarily always) include parental SUD. As well as improving outcomes for vulnerable families, these programmes aim for improvements felt in the wider community and society, including local cost savings.

FIPs were launched in 2006 and were aimed at addressing antisocial behaviour in communities by helping the most high-risk and chaotic families through intensive interventions (Kydd & Roe, 2012). Families had multiple and complex needs, such as domestic violence, mental illness and parental SUD, and were likely to already be receiving, or at risk of receiving, some kind of statutory intervention. An assessment of intensive family working which justified the launch of FIPs was conducted in 15 local authorities with 53 families. The research, commissioned by Government, reported that a £1million investment was associated with a social return of £2.5 million (Kendall et al., 2010), or a social return on investment (SROI) of 2.5:1. However, the study was limited by the small sample size, the lack of a control or comparison group, the lack of external data sources to verify the outcomes reported by workers, inconsistency in delivery models across local authorities, and the lack of follow-up interviews with families after completing the programme to assess whether outcomes were sustained.

While each area developed a delivery model specific to local need, crucially, a focus on systems change was common to all. All local authorities focused on developing integrated governance, policy-making and operational practice, e.g. commissioning and information sharing (Kendall et al., 2010), with a single dedicated assertive worker considering whole family needs. Among families that completed the programme by March 2012, there was a 39% reduction in drug use and 47% in alcohol use, a 36% reduction in child protection issues and a 49% reduction in ‘poor parenting’, suggesting that national implementation was effective in improving outcomes for communities and families (DCLG, 2012).

In 2011, FIPs were replaced by the national Troubled Families Programme. The Ministry of Housing, Community and Local Government required local authorities to make a whole family assessment of support needs and to assign each family on the programme a key worker or care manager. The national evaluation matched participants to a wide range of government administrative datasets to create a comparison group and compare outcomes. This did not include the NDTMS. The evaluators found it to be as effective or more so than other programmes supporting families with multiple and complex support needs. The economic evaluation found a benefit-cost ratio 2.28:1. The programme was expanded to include ‘reducing and recovery from substance use’ as a key outcome and since 2021 and rebranded to the less judgemental and accusatory ‘Supporting Families’. In the Autumn Budget 2021, the government announced an additional £200 million to supplement the £500 million already invested for the programme from 1 April 2023 to 31 March 2025 (Foster, 2023).

In 2018, local authorities in England were invited to bid for their potential share of a £4.5 million innovation fund to develop plans which aimed to improve outcomes for the children of parents with an alcohol use disorder. Nine areas (spanning 13 local authorities) were successful. Funding was initially set for two years up to 31 March 2021, but was extended another year through £700,000 funding to assuage the impact of the COVID-19 pandemic. The Children of Alcohol Dependents Programme was managed by Public Health England and funded jointly by the Department of Health and Social Care and the Department for Work and Pensions (DWP). Local authorities had to include DWP’s Reducing Parental Conflict programme in their delivery. An independent evaluation found positive results for local systems, parents and children through interviews and synthesis of local analysis and evaluations, namely: earlier identification of parents with alcohol use disorder and their children, improvements in local systems for supporting families, and better outcomes for families (Tavistock Institute of Human Relations, 2023). However, the size and varying quality of local analyses and evaluations make a robust assessment of the effectiveness of the programme challenging.

One participating area used the funding received from the Children of Alcohol Dependents Programme to enhance their Moving Parents and Children Together (M-PACT) offer to families. Introduced in 2006 and developed by Action on Addiction, a UK-based charity working with people affected by SUD, M-PACT is an adaptation of the Strengthening Families Programme. M-PACT brings together a small number of families with children aged 8-17 and runs for 12 weeks. It uses a psychosocial and education approach to sessions which focus on the impact of substance use, family strengths, communication skills, wellbeing, safety, the home environment and familial relationships. A reunion brings families together again three months after completion of the programme. M-PACT is delivered across England, Wales and the Republic of Ireland in community and prison settings. Comic Relief and The Royal Foundation joint-funding has led to it also being delivered in partnership with Place2Be in schools. Analysis has shown that families reported improvements over time in: global family functioning; the severity of the problem as they perceived it; how families thought they were managing; how families viewed the programme; and coping efficacy. A social return on investment (SROI) evaluation found an SROI of 6.53:1 within the first year of completing the programme (Templeton, 2018).

Another area participating in the programme was Brighton and Hove. The Brighton Oasis Project delivers support for women with SUD and their families with the aim of reducing SUD and improving parenting thereby keeping families together. Recognising that access to childcare can be a barrier to women accessing services, the Project has a creche. The Project is a partner agency in the area’s Parents of Children at Risk (POCAR) programme for children who are on a child in need or child protection plan. Partner agencies working together was integral to its design and key to its success. This has necessitated agreeing and establishing care pathways, referral routes and information sharing (Welsh et al., 2008). An evaluation by New Economics Foundation Consulting commissioned by the Project estimated a return on investment (ROI) of 3.83:1 from savings to children’s social care alone associated with POCAR, with the largest benefit resulting from children remaining in or returning to, the care of their mother (Crack et al., 2015).

While the results from M-PACT and POCAR seem promising, evaluations have not been peer-reviewed, and both lacked comparison groups with which to compare outcomes, and follow-ups to assess long-term outcomes.

A more prevalent intervention for parents who use substances and are at risk of having their children put into care are family treatment drug courts (FTDCs), known as family drug and alcohol courts (FDACs). Originally established in the US, most states have implemented one. Encouraged by the promising findings emerging from the US and rooted in concerns about the lack of coordination between adult and children’s services and the high costs of standard proceedings (Harwin et al., 2014), three pilot sites were established in London. By 2023, there were 14 services working in 22 family courts in 38 English local authorities.

The main aim of FDAC is permanency, i.e. a constant, stable living situation. Multidisciplinary teams comprising judicial representatives and adult treatment and child social workers support families and monitor progress, typically for one year. Collaborative working and regular monitoring expedite access to treatment for parents at the start of court proceedings and later should they complete treatment and then relapse. To graduate, parents must successfully complete treatment, sustain their recovery for a pre-specified amount of time and demonstrate that they can provide safe and stable living environments for their children.

In England, mothers in FDAC were significantly more likely to stop using substances than those who were not, and when compared with mothers who were reunified with their children, intervention mothers were significantly more likely to sustain their recovery during a five-year follow-up period (Harwin et al., 2018; Harwin et al., 2016; Harwin et al., 2014). The authors found no significant differences observed in the time it took to achieve permanency over five years although families were significantly more likely to remain together/ be reunited at the end of court proceedings and at subsequent follow-ups. Harwin et al. (2014), in their report funded by the Home Office, reported that the cost of the FDAC team per family (£8,740) was offset by the savings resulting from reunification, despite finding no significant differences in achieving reunification and permanency.

While there have been high-profile interventions delivered in England for parents with SUD, there is a need for robust independent peer-reviewed research to evaluate their effectiveness and cost-effectiveness.

### Scientifically evaluated programmes

A review of the literature on the effectiveness and cost-effectiveness of interventions for parents with SUD was submitted as part of my confirmation review (upgrade from MPhil to PhD in July 2019). This was prior to key systematic reviews presenting and synthesising pertinent studies being published (El-Banna et al., 2021; McGovern et al., 2022; Minozzi et al., 2020; Neo et al., 2021; Sampaio et al., 2024). This section summarises the key findings from the systematic reviews relevant to my population of interest: parents with SUD who are receiving treatment only or are receiving treatment plus an intervention that promotes and protects child welfare, such as a parenting programme or children’s social care, with studies from the UK discussed in detail, as these are likely to be most relevant to my research.

The literature review submitted for upgrade, updated to March 2024, and including studies pertinent to my research from the recently published systematic reviews is presented in *Appendix A*.

In a Cochrane systematic review of methadone and buprenorphine for pregnant mothers with an opiate (viz. heroin) use disorder, Minozzi et al. (2020) reviewed four studies but could only pool results from two trials (Jones et al., 2005; Winklbaur-Hausknost et al., 2013), as evidence was lacking. Methadone and buprenorphine are pharmacological maintenance options for pregnant heroin users, releasing a steady dose of opiates to prevent the foetus from experiencing repeated withdrawals. Minozzi et al. (2020) found that while methadone prescribed patients were less likely to drop out of treatment than those prescribed buprenorphine, they were more likely to be using illicit opiates at 15-18 week follow up. However, the quality of evidence was graded low to moderate because of high attrition and small sample sizes. Smith et al. (2009) aimed to evaluate the effectiveness of pharmacological interventions in pregnant mothers receiving treatment for an alcohol use disorder in their Cochrane systematic review but were unable to find a study that would meet their criteria to include, highlighting that robust research in this area is severely lacking.

While the evidence base for psychosocial interventions for parents with SUD is larger than that for pharmacological ones, it is still limited as psychosocial interventions are wide ranging and very few studies exist for each type. A recent Cochrane systematic review of psychosocial interventions for parents (McGovern et al., 2022; McGovern et al., 2021) found moderate‐quality evidence that psychosocial treatments tailored to parents may reduce substance use frequency compared with usual care or other comparison conditions.

While substance use can impact parenting capacity, parents who become abstinent do not necessarily become ‘good’ parents, just as not parents who use substances are not necessarily ‘bad’ parents. Parents with SUD may themselves have been children of parents with SUD and/or may have limited experience of positive relationships with their own parents, which may have adversely affected their parenting skills. Parenting interventions in the context of parental SUD not only aim to improve parenting capacity and familial relationships, but they can also help parents become aware of how their substance use affects their children.

In recent years, there have been several reviews on parental SUD and parenting interventions. For example, Moreland and McRae-Clark (2018) conducted a review of parental outcomes following treatment that offered a parenting skills component alongside usual care. While interventions and settings varied, the authors found improvement on parenting outcomes following engagement with treatment and a parenting intervention. Subsequently, the Cochrane review by McGovern et al. (2021) found that treatment integrated with parenting interventions may be more effective at reducing alcohol and drug use among parents compared with treatment alone, and that mothers may need more intensive support than fathers. The evidence also suggested that children should not be present during treatment sessions for their parents (McGovern et al., 2022; McGovern et al., 2021). The authors noted that the evidence used to generate these results were of low-quality owing to significant risk of bias identified. Most studies included in the reviews focused on mothers with SUD, although Lam et al. (2009) and (Stover et al., 2019a) both centred on fathers, while Barlow et al. (2019) studied both mothers and fathers.

Very few academic studies of psychosocial interventions combined with parenting interventions from the UK exist. The Parents under Pressure (PuP) programme is a 24-week home-visitation intervention for primary caregivers (male and female) of children younger than 2.5 years receiving methadone treatment. It comprises 12 modules relating to parenting and coping skills within a care management structure, meaning parents can also receive support outside of these times should they need it. A Brisbane, Australia PuP RCT originally reported that intervention parents demonstrated significant improvements across several areas such as stress and child abuse potential, although a sizable proportion (36%) of the group maintained their high-risk status (Dawe & Harnett, 2007). The promising findings of the programme were substantiated in the UK RCT by Barlow et al. (2019) which benefited from a better study design: the UK RCT was close to real-world conditions across several sites with a comprehensive cost-effectiveness analysis. The authors reported that the intervention had a 52% probability of cost-effectiveness at a willingness to pay (WTP) of £1,000 per unit of Brief form of the Child Abuse Potential (BCAP) Inventory (Ondersma et al., 2005) score improvement and a 98% probability at WTP of £20,000. As there is no established WTP of a BCAP unit improvement, it is not possible to determine with confidence that the intervention would be considered cost-effective by decision-makers. When using Quality Adjusted Life Year (QALY) gains to measure cost-effectiveness, the authors found that the intervention was above the National Institute for Health and Care Excellence (NICE) threshold of £20,000-30,000 per QALY gain at about £34,000 and so would not be considered as cost-effective by NICE.

More recently, Whittaker et al. (2022) assessed the feasibility and acceptability of the PuP programme for fathers with an opioid use disorder (‘PuP4Dads’), and their families. The programme was delivered successfully and authors concluded that a full-scale evaluation was feasible. The authors reported promising outcomes in terms of SUD reduction and father-child dyads.

Forrester et al. (2008) and Forrester et al. (2014) analysed the impact of an Intensive Family Preservation Service (a.k.a. ‘Option 2’) in Wales: an intensive four-week home-based case management intervention which targeted parental substance users whose children were at risk of being placed into care. Workers were paraprofessionals incorporating motivational interviewing techniques, on call 24/7 and working with one family at a time. The quasi-experimental study found that the likelihood of entering care was the same for both the intervention and comparison groups (about 40%), however children receiving the intervention took longer to enter care and spent significantly fewer days in care. This resulted in a benefit-cost ratio of 1:1.54. At follow-up (up to 5.6 years), intervention children were significantly more likely to be at home than comparison children. It should be noted that costs data related to placement costs only. Other pertinent expenses such as social worker allocation were not included. While this would underestimate the overall costs there is likely to be little difference between the intervention and comparison groups. However, there may well be differences in service usage outside the realm of social work, which may impact cost-benefit findings, namely parental treatment, education, criminal justice and health. It is not clear whether the intervention would remain cost-beneficial were such outcome costs included in the cost-benefit analysis. Further, the comparison group received a range of services that were not identified, making it difficult to demonstrate either effectiveness or cost-effectiveness of the intervention. The positive ﬁndings of Option 2 has contributed to an adapted version being rolled out across Wales, as well as in some local authorities in England.

Option 2 is an example of treatment integrated with statutory child welfare support, including parenting interventions, typically offering a combination of treatment, child social work and legal support to extremely vulnerable families whose children have been removed from their primary caregivers or are at risk of being put into care. As such, they represent the most extreme cases of familial vulnerability and risk of harm associated with parental SUD. Outcomes for such programmes typically centre on familial reunification, no further maltreatment related to parental substance use and/or placement in a safe permanent home (‘permanency’), which may be achieved away from the familial home if it is in the best interest of the child.

A systematic review by Murphy et al. (2017) explored the effectiveness of interventions addressing parental substance use for families involved with the statutory child welfare system, such as Option 2 and FDACs. The authors found that all effective interventions in terms of treatment completion and family reunification, irrespective of the treatment model, provided comprehensive individually tailored support. Another review for mothers by Neo et al. (2021) found few high-quality studies for inclusion. Results suggested that integrated programmes appear to produce beneficial outcomes, specifically treatment completion, reduction in maternal substance use and/or families staying together. However, more research is needed to support this finding.

All the available evidence suggests that there are several interventions aimed at supporting parents with SUD and their children, which can be grouped into treatment only, treatment plus a parenting intervention and treatment plus statutory child welfare. While some interventions show promise, e.g. the Parents under Pressure, or PuP, programme, without government investment to support implementation on a large scale, it is unlikely they will be commissioned by English local authorities.

## Summary of main points raised in the introduction

SUD among parents is associated with many adverse outcomes for both parents and their children which are likely to be associated with substantial social and economic costs. Prevalence estimates of parents with SUD and the number of children affected in England exist but understanding the true scale of the problem is undermined by the hidden nature of parental SUD, the lack of comprehensive data, and the failure of agencies working with children and their parents to collaborate. The lack of understanding of parental support needs and universal multiagency collaboration potentially puts children at risk and impedes the likelihood of parents to recover from SUD and improve their parenting skills and familial relationships. While there is no agreed international approach to addressing parental SUD, treatment, targeted prevention and statutory child welfare are strategies available to policy and decision-makers in England. While there is a vast evidence base supporting treatment as an effective and cost-effective approach to SUD generally, the equivalent for parental SUD is lacking. Compared with treatment alone, the evidence does however suggest that treatment plus a parenting intervention may be effective in reducing parental substance use and improving parent-infant dyads. There have been and continue to be some high-profile interventions delivered in England for parents with SUD, backed by national evaluations and Government funding. However, the lack of independent and high-quality studies is problematic. This chapter makes clear the need for more evidence on the specific support needs of parents with SUD in the treatment, as well as effectiveness and cost-effectiveness research on interventions for parents with SUD, especially in the English context.

## Thesis research questions and aims

I hypothesised that parental characteristics (e.g. their sex, whether a parent lives with their child or not, the type of substance they used) would affect the type of intervention to which they would be assigned, and that outcomes would differ by parental characteristics and intervention type. Thus, the following research questions using the NDTMS were explored:

1. Do patient characteristics affect the types of interventions parents/ carer with SUD receive and/or their outcomes?
2. Is treatment plus statutory child welfare support a more effective option than treatment alone for parents/ carers with SUD?
3. Is treatment plus statutory child welfare support a more cost-effective option than treatment alone for parents/ carers with SUD?

It is hoped that the results and learning from this thesis will:

* add to the limited evidence base and provide researchers with replicable descriptive, effectiveness and cost-effectiveness techniques which could be adopted and adapted in various geographical contexts,
* provide policymakers, decision-makers and practitioners with recommendations on how best to support parents with SUD in increasingly financially constrained times,
* make a positive difference to the lives of the most vulnerable families in society.

# Methods

This Chapter provides context for the genesis of this work, discusses its evolution over seven years (including before, during and after the COVID-19 pandemic), and summarises the methodology used in the three interconnected quantitative analyses studies submitted for, or due to be submitted for, publication (chapters 3-5).

## Background and context to the methods chosen for this thesis

I have worked in the public sector for almost 20 years, specialising in applying evidence to inform local and national government alcohol and drug treatment decisions. Since January 2020, my role has focussed on evidence, treatment delivery and policy for parents/ children and young people with alcohol and drug problems within the Office for Health Improvement and Disparities (OHID), part of the Department of Health and Social Care.

While working in the Value for Money team for the National Treatment Agency for Substance Misuse in England between 2010 and 2013, then leading Public Health England’s (PHE) Alcohol, Drugs and Tobacco Directorate’s Value for Money programme until 2019, I developed economic methods to estimate the social and economic benefits associated with alcohol and drug treatment. We were able to match the National Drug [and alcohol] Treatment Monitoring System (NDTMS) which we owned, with other national datasets such as the Police National Computer and Hospital Episode Statistics, as well as use published scientific evidence, to demonstrate that on average, treatment provides a social and economic benefit, because once in treatment, people with SUD commit fewer crimes and improve their health (Musto Wright, 2018). This meant that in discussions with HM Treasury, we were in a strong position to make the case for investment in alcohol and drug treatment.

During this time, the implementation of the Health and Social Care Act (2012) in April 2013 led to a complete reorganisation of the National Health Service (NHS) in England, significantly changing public service delivery and commissioning. The responsibility of commissioning alcohol and drug treatment, and other public health services moved from the NHS to local authorities. This meant that from April 2013, based on an agreement with Her Majesty’s (HM) Treasury, the money allocated to local authorities to spend on treatment became part of a much wider public health grant. The treatment component was not ring-fenced and thus areas could decide to use the money for other public health interventions, such as those to prevent obesity or diabetes, if these were assessed locally as being more pressing. Local authorities were managing competing priorities, political imperatives, increased demands and stakeholder relationships (Wye et al., 2015) while facing ever tightening budgets (Black, 2021) in a relatively new and challenging commissioning environment.

By estimating crime and health benefits in our economic modelling, we were highlighting savings to the criminal justice system and the NHS respectively (Musto Wright, 2018). Such savings do not go back to local authorities as they do not fund these services. Directors of Public Health, local councillors and other local decision-makers wanted to know how much local investment in alcohol and drug treatment could potentially save *them*. It struck me that by looking at families affected by parental SUD, we could start to give our commissioners more locally-relevant evidence. It is commonly understood by commissioners that families affected by parental SUD are more likely to be using social care, educational (e.g. pupil referral units) and other local authority resources (e.g. housing) than families not affected by SUD or other adverse childhood experiences. Therefore, investment in treatment for parents with an SUD could potentially reduce these costs which could translate into direct savings to local authorities. However, robust scientific evidence to estimate the economic benefits of investing in treatment from a local authority perspective did not exist.

For these reasons, I set about changing the situation and developing the evidence base with a focus on improvements in both parental treatment and child welfare (viz. children’s social care) outcomes.[[1]](#footnote-2) I would not have had the time to do this analysis and evidence generation within my previously defined full-time job roles with PHE/OHID. It is for that reason that I decided to undertake the part-time PhD. The PhD has given me the opportunity to go some way to addressing the research gaps on the effectiveness and cost-effectiveness of treatment for parents with SUD and thus to provide national and local stakeholders with more evidence to support their decision-making.

### Initial thesis plan submitted for confirmation review

The thesis plan submitted as part of my confirmation review (upgrade from MPhil to PhD in July 2019) comprised two parts. Part one, consisted of the rationale for the PhD topic, discussion of issues identified in the literature, and an early analysis at national (England) level of effectiveness and cost-effectiveness using only data from the NDTMS. Part two discussed the detailed plans for my work, informed by methods and findings from the NDTMS study, and recognising that there is no national children’s social care dataset that could be matched to the NDTMS. The core plan involved obtaining and integrating local data from both alcohol and drug treatment services and children’s social care. At the time the confirmation review was submitted in July 2019, I had positive and encouraging communications with five local authorities. Areas who had expressed an interest in working with me at this stage were: Ealing, Haringey, Essex, Kent and Brighton.

I recognised that there were several scenarios regarding data availability. In the best case ‘optimal’ scenario, local areas would allow access to anonymised individual person specific electronic data from children’s social care that could be matched to the same individual who received treatment in the NDTMS dataset. In the next-best ‘adequate’ scenario, local areas would allow access to written case files/ quantitative data for individuals/families where child social workers have identified parental SUD as a familial issue. This could be translated into a database by myself or local official, and then matched to the NDTMS.

In either scenario, person identifiers needed to match the datasets were planned to be the following: first and second name initials, sex, date of birth of parent, local authority of residence, as this is how NDTMS records individual attributable information. The NDTMS data would be used to identify parents and monitor their treatment outcomes. The sociodemographic and clinical data collected in the NDTMS would be used to adjust for potential confounding in the statistical analyses. In addition to treatment, the NDTMS data would be used to identify parents receiving recovery support interventions such as parenting and/or family recovery support. Children’s social care data would be used to identify families involved with targeted early help or who were receiving statutory child welfare interventions such as being on a child in need plan, a child protection plan or a having a child being placed into care. Time spent in receipt of these interventions between those with parents in treatment would be compared with those with parents or carers not in treatment, to see whether being in treatment is associated with less time spent on an early help/ statutory child welfare intervention, and how this translates into differential costs.

In the worst-case scenario, only NDTMS data would be used to analyse early help/ statutory child welfare service use. While the NDTMS does not collect time spent in these interventions, at this stage I believed that I would be able to robustly analyse the changes in intervention status to estimate outcomes and costs. For example, whether parents with children in care at the start of treatment were living with their children at the end of their treatment journey, or whether children on a child in need plan at the start of a parent’s treatment were stepped down to an early help intervention or stepped up to a child protection plan.

Bottom-up costing is generally considered optimal in health economic evaluations, particularly for new interventions. Bottom-up costing represented the best-case costing scenario and would require resource data to be collected for each individual in a study and assigning monetary values to the resources data. However, like all cost estimations, it may still involve methodological assumptions or decisions that may compromise robustness and practicality (Špacírová et al., 2020, 2021). The top-down approach to estimating unit costs, on the other hand, is relatively straightforward: divide total expenditure by total units of activity over the same timeframe. While this approach is simple, it cannot be used to identify what actually drives costs, other than number of people and time spent in treatment. This could lead to potential cost underestimation or overestimation. Unit costs data would be taken from the *Unit Costs of Health and Social Care* updated and published every year (Personal Social Services Research Unit, 2024).

Table 2.1‑1 below summarises the data that would be needed under the three scenarios, as set out in my confirmation review.

*Table 2.1‑1 Data options under three scenarios*

| Type of data | Optimal | Adequate | Worst case scenario |
| --- | --- | --- | --- |
| Intervention and outcomes data | Electronic parent/carer-level data from local children’s social care services that is already matched or could be directly matched to the same person-level treatment data in the NDTMS. | Person-level data from local authorities that would need to be translated into a database then matched to the NDTMS. | NDTMS only. |
| Costs | Bottom-up local costing data. | A mixture of bottom up and top-down estimates based on data availability. | Costs based on top-down estimates of reported local authority spend and NDTMS activity data. |

It was anticipated that using local authority data, three treatment strategies could be analysed and compared (see Figure 2.1-1 for a schematic):

1. parents with SUD are assigned to both treatment and early help/ statutory child welfare services
2. parents with SUD are assigned to treatment but not early help/ statutory child welfare services
3. parents with SUD not engaging in treatment but are receiving support from early help/ statutory child welfare services

There was of course, a fourth alternative: parents with SUD not engaging with either service. However, as people on this pathway would neither be on the treatment nor the children’s social care dataset, the costs and outcomes of this group would not be possible to estimate and so the focus of the proposed research was on strategies 1, 2 and 3. In the worst-case scenario, only strategies 1 and 2 could be explored.

*Figure 2.1‑1 Treatment strategies schematic*

1: Families receive both kinds of support

4: No support (unmet need)

### The COVID-19 pandemic and its impact on the initial thesis plan

In early 2020, the COVID-19 virus began spreading in the UK. On 11 March 2020, the World Health Organisation characterised the virus as a global pandemic (WHO, 2020). Shortly after, the UK went into its first national lockdown. What followed were almost a year of lockdowns, legislation/ emergency powers and restrictions being introduced, followed by another year of restrictions slowly easing (Institute for Government, 2022).

During this time, there were increasing reports of parents drinking or using drugs more to cope with isolation, stress and domestic abuse (Moore & Churchill, 2020; NSPCC, 2020; Tavistock Institute of Human Relations, 2022). In a typical week, the NSPCC helpline receives around 200 reports related to parental alcohol and drug use concerns, but between April 2020 and January 2021, this had increased by 66% (NSPCC, 2022). Some vulnerable children lost their usual protective factors during social isolation and lockdowns, such as regularly attending school or visiting grandparents. Concerns were also raised about the detrimental effect on mothers in recovery who recently gave birth, as they were at an increased risk of fatal overdose, because they had lower levels of available social support, which is highly protective against postnatal mood disorders and critical for healthy early parent-infant bonding (Clark et al., 2021). Child social workers described an increase in the complexity of their cases, including a rise of alcohol-related parenting issues and an increase in demand of alcohol and drug treatment services (DfE, 2021).

Alcohol and drug services had to adapt their support to families. Face-to-face meetings and visits were mostly replaced with online video platforms and/ or calls. Many older children and parents engaging with treatment and/or statutory child welfare responded well to online/ video chats – they are platforms many children are comfortable with and to access support and parents do not need to worry about childcare arrangements. The Tavistock Institute of Human Relations, who surveyed the local areas involved in the Children of Alcohol Dependents Programme discussed in chapter 1, also found significant challenges to effective support being offered to children and families (Tavistock Institute of Human Relations, 2022). For example, areas reported digital poverty among some families, which prevented therapeutic care. Internet access was also an issue for younger children who do not own a smartphone or have unsupervised access to the internet. Therapists spoke of both children and parents not being able to access a safe space in the home from which they could talk openly or engage meaningfully in therapeutic activity. This was particularly true of young people who found it difficult to explore thoughts and feelings about their parent’s drinking within earshot of their parents. Furthermore, therapists feared that some parents were hiding problems which would not be revealed until they reach crisis point.

In this context, and not surprisingly, the local authorities who had initially agreed to participate in my thesis were not able or willing to take on the additional work required to help me acquire data (to further complicate matters, some areas did not have the appropriate data sharing agreements in place to share between treatment and social care services), nor did they want a government employee such as myself scrutinising local practice. I held out for the local authorities for as long as I could in the hope that eventually as restrictions lifted, I could gain access to local data, even if it was just in one local authority. However, with the exacerbating strain on local resources and the proficiency to collate data varying among LAs, continuing to work with each area on their different consent and information sharing arrangements and applying for ethics approval for each LA separately was no longer feasible. During December 2021-July 2022, I took a period of study leave so I could concentrate on a secondment leading on stakeholder engagement and cross-government policy for establishing the Family Hubs and Start for Life programme in 75 local authorities[[2]](#footnote-3). On my return to study, my supervisors and I felt we had to abandon the idea of getting hold of local data so that I could progress with my thesis, particularly as I was due to take another period of leave – maternity leave – from October 2022. As such, we decided to adopt the ‘worst-case’ scenario, i.e. relying on NDTMS data only.

### The ‘worst-case’ scenario for data: The NDTMS (‘it’s really pretty good!’)

The potential of linkable datasets that would incorporate matched local treatment data with children’s social care data was regarded as a ‘gold mine’ piece of the thesis by the supervisory team. Nevertheless, the NDTMS on its own is a large administrative dataset which provides a wealth of data that hitherto had not been comprehensively analysed in the context of parents with SUD.

The NDTMS collects data from every publicly funded alcohol and drug treatment provider in England. This includes specialist NHS and third-sector agencies providing pharmacological, psychosocial and recovery support services in community outpatient, hospital inpatient or residential settings. This amounts to around 1,000 treatment services across the country reporting monthly to the NDTMS (Burkinshaw et al., 2017) Thesis-relevant variables included within the dataset include individual attributes: age, sex, local authority of residence; clinical information, e.g. substances used, whether the patient is a current or former injector, whether or not the patient has a comorbid mental health problem, and treatment and recovery support interventions accessed; social information, e.g. employment and housing status; outcomes information, e.g. treatment exit reasons (successful completion treatment, drop out, transfer into another treatment provider or prison, death) and reductions in substance use. The NDTMS system was developed in 2001 and became fully operational in 2005 under the National Treatment Agency for Substance Misuse, and robust data is available from April 2005. From 2013 to 2021, it was managed by PHE after which, it became the responsibility of OHID. Explicit patient consent is required for data to be submitted. The consent forms and privacy notices explain to patients how their data may be used, including a process to anonymise individual records for the purposes of research. Over 98% of patients provide this consent (Marsden et al., 2009).

Data on the type of early help or any statutory child welfare services a child of a parent or carer in treatment may be receiving is a relatively new addition to the database, with the first report using data from 1 April 2017.

### Positionality linked to informing study design

In my current and previous roles, I have been able to take advantage of ongoing and informal engagement with stakeholders/ experts which have informed my study design. For example, through talking to stakeholders, I have been signposted to relevant and useful studies, been able to talk through previous approaches to NDTMS analysis with colleagues, I have been able to sense check findings and I have been able to get a sense of what would be useful to inform policy and decision-making in national and local government.

## The revised thesis plan

The above contexts and considerations led me to decide that there would be three distinct but related studies in my thesis, each using data from the NDTMS, to estimate the effectiveness and cost-effectiveness of treatment delivered to parents with SUD in England. Each study builds on the findings from the previous study. Chapters 3-5 of the thesis present the studies in journal article form.

Study 1 recognised that the NDTMS data had not been comprehensively analysed for parents in the scientific literature. Thus, **a descriptive and exploratory first study**, the findings of which would inform the subsequent two studies, was deemed appropriate. This first study is a national longitudinal observational cohort study to estimate the associations between parental status (parent living with child, parent not living with child), interventions (treatment only vs treatment plus different intervention that promote and safeguard child welfare) and successful treatment completion. ‘Child welfare’ included non-statutory (parenting and/or family recovery support, ‘early help’) and statutory children’s social careservices (child on a child in need plan, child protection plan or child in care). In this first study, I generated a multiple imputation dataset to fill in gaps on some missing variables for some participants (see chapter 3 for more detail).

The aim of the second study was to test whether parents were more likely to complete treatment successfully if they received treatment plus a targeted prevention, namely parenting and/or family recovery support or early help, compared with treatment only.

It is probable that parents of different sex, different child living arrangements using different types of substance use will have different risk factors. For example, heroin users in treatment are more likely to be committing crimes at the start of treatment than non-heroin users (Gossop et al., 2005), they are at risk of injecting-related wounds (Fink et al., 2011), hepatitis B, hepatitis C and HIV (Rashti et al., 2020) and many are likely to experience at least one overdose, with many more having witnessed an overdose (Strang, 2015). In principle, a Randomised Control Trial design would be the best way to balance the characteristics of parents among intervention groups to allow any differences in measured outcomes to be fairly attributed. However, not only would a trial be resource intensive, but it would also be unethical and potentially dangerous to randomly allocate parents into an intervention option, as this could deny patients with a specific treatment need and/or families requiring targeted or statutory interventions the appropriate support. In lieu of a randomised control trial, **the second study used a quasi-experimental approach**.

Most propensity score approaches compare one intervention to another, typically, a control. Comparison of multiple interventions are more complicated, but there is emerging research to show how these could be performed. McCaffrey et al. (2013) found that when using propensity score estimation of multiple treatments, such as in our model, Generalized Boosted Models (GBM) outperformed simple logistic regression models with iterative variable section. Their GBM approach led to the extension of the Toolkit for Weighting and Analysis of Nonequivalent Groups, or ‘twang’, originally designed to make causal estimates in the binary treatment setting in R to handle multinomial propensity scores (Burgette et al., 2021). Thus, I used the multinomial propensity score extension of twang to adopt a GBM approach.

Comparison groups were created to randomly allocate parents into intervention options using GBM for multiple interventions (Burgette et al., 2021; McCaffrey et al., 2013). GBM estimates propensity scores and their weights using a nonparametric machine learning technique which commands the researcher to specify the baseline covariates to balance between comparison groups. The GBM algorithm establishes which model for the propensity score is the most appropriate and estimates propensity weights to calculated causal estimated for different intervention options.

There is not enough information in the NDTMS to account for differences in child safeguarding risk, but being on a statutory child welfare intervention is likely to have an effect on outcomes for parents in treatment. For example, parents engaging with statutory child welfare may need additional support to cope with their child either being in care or at risk of being placed in care. Similarly, they may need support to help ensure no further child safeguarding risk if a child is returning to their care.

Thus, statutory child welfare interventions (child on a child in need/ child protection plan or child in care) were included in the model to account for the differences in risk, rather than to measure the average treatment effect (ATE) of treatment plus different statutory child welfare interventions compared with treatment only for a treatment population.

Outcomes used were ATEs, rather than Average Treatment Effect on Treated (ATT), to take into account the effect of a targeted prevention intervention on the entire cohort, similar to randomisation, as opposed to just those who received the intervention. ATE is useful when an intervention can be recommended universally across a population. However, we assumed that the patient sex, type of substance used and child living arrangements were important factors in a practitioner assigning a parent to an intervention strategy and as such stratified our sample accordingly.

The **third study uses a cost-effectiveness approach**. The treatment effects observed in the second study were applied in this study. The second study showed consistent effectiveness results for the subgroup of alcohol only users when comparing treatment plus parenting and/or family recovery support versus treatment alone. In light of these findings, I decided to focus my third study on analysing the cost-effectiveness of treatment only compared with treatment plus parenting and/or family recovery support in people treated for alcohol only. The second study also showed statistically significant effectiveness results for non-opiate users (again for treatment plus parenting and/or family recovery support versus treatment alone), and so I did consider a fourth study: a cost-effectiveness study of non-opiate users but decided against this for the following reasons. First, because ‘non-opiate use’ is a broad category comprising many diverse substances, such as powder cocaine, crack cocaine, MDMA, methamphetamine and cannabis, it would be very difficult and resource intensive to find the needed health economic data in the published scientific literature which could be used in the decision modelling for each non-opiate substance type. Second, a brief scoping exercise indicated that the literature is much less well developed for some non-opiate users than others, for example there was limited evidence on health state utilities and lifetime SUD trajectories for dependent ketamine users compared with cannabis users.

## Overarching methods common to all three studies

As this thesis is presented in journal paper form, the methods for each three studies are presented in the individual study chapters (3-5). Below are the methods common to all three which were not included in great detail in the study chapters.

### Population

Only adults (≥ 18 years) parents were included. All patients accessing specialist treatment should be asked about their parental status and this information should be reported on the NDTMS. Under the reporting rules, a parent can be a: biological parent, step-parent, foster parent, adoptive parent, guardian or a de facto parent (where a patient has taken on partial or full parenting responsibilities). Parents should be asked whether all, some or none of their children are living with them (Public Health England, 2019), and this information should be updated following each care plan review, which happens at least once a year.

Figure 2.3‑1shows the flow diagram of the patients from the data extract. A total of 128,840 patients were extracted from the dataset. Patients who were assessed by a practitioner as needing treatment but had not yet started (n=1,295), and patients with no parental status recorded (n=2,531) were excluded from the analyses. While there are many quality checks on NDTMS data (PHE, 2019b), there is no rule to prevent inconsistent data on families being recorded. For example, an individual can be recorded as a parent living with children in one field and living with 0 children in another during the same timeframe. Such contradictory cases were excluded (n=5,853).  Of the cases included, there were 57,529 parents or carers (48.2%) who were categorised into ‘Parent living with children’ (n=18,161, 31.6%) and ‘Parent not living with [any of their] children’ (n=39,368, 68.4%). A parent may not be living with their children because they are separated, but may still be in contact, or their child may be in care.

*Figure 2.3‑1 Flow diagram of patients*

All triaged patients 1 April 2017 to 31 January 2020 (n=128,840)

Patients who started a treatment intervention (n=127,545)

Patients with parental status recorded (n=125,114)

Patients with no inconsistencies in parental status/ number of children recorded (n=119,261)

Non-parents (n=61,732)

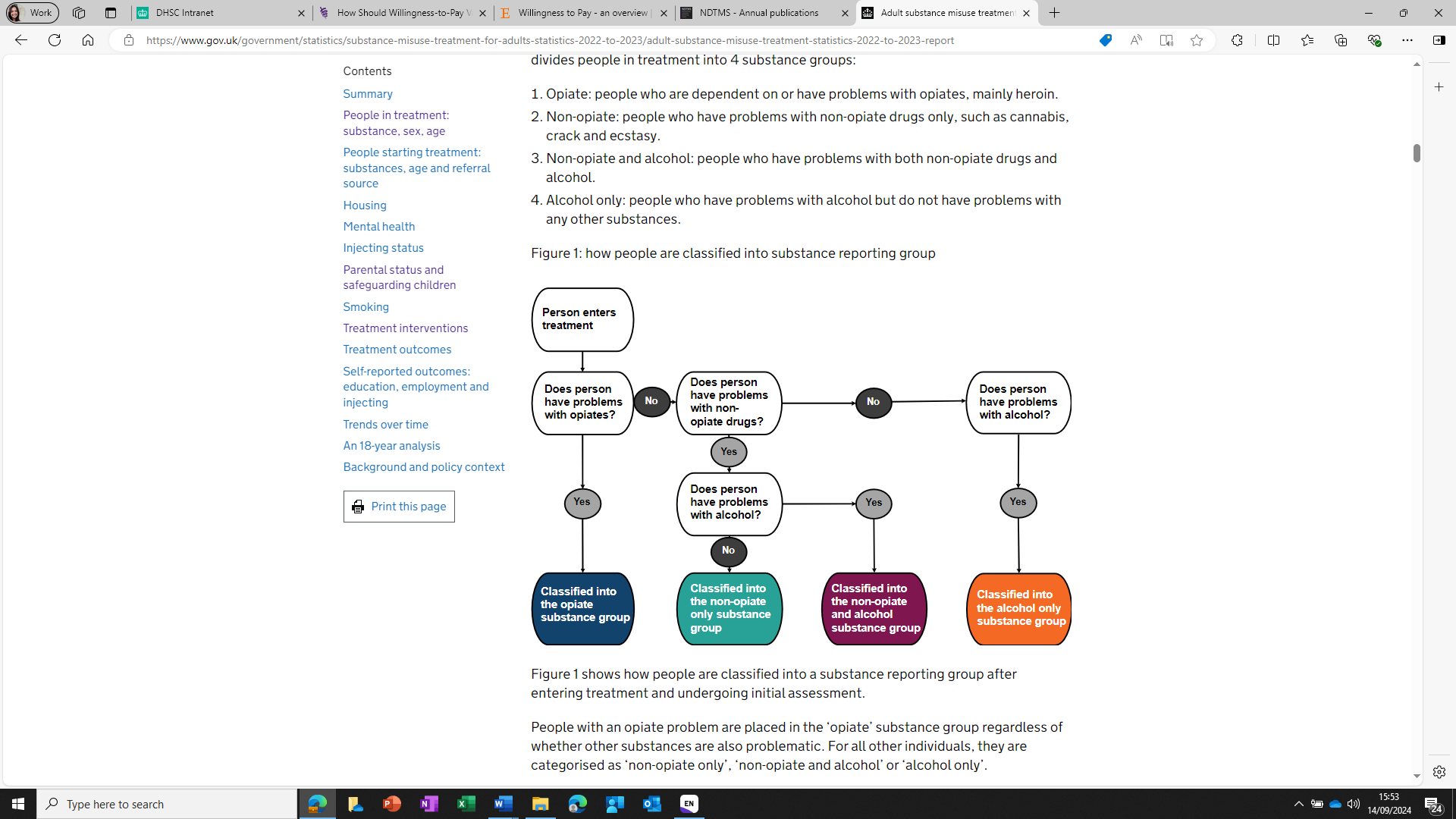
Parents (n=57,529)

Parents living with children (n=18,161)

Parents not living with children (n=39,368)

Data was further segmented by sex and SUD. Reporting of SUD using the NDTMS typically uses four categories: opiate users, non-opiate only, non-opiate and alcohol users, and alcohol only users. Irrespective of other substances used, an opiate user is simply classified as such. In addition, alcohol may be cited as a problem substance in any grouping but is only separated out in ‘alcohol only’. The rationale for the hierarchical strata by PHE and then OHID, is to reflect different individual and social risks, harms and outcomes associated with different substances, as well national strategic priorities. Neither PHE nor OHID reference any evidence to justify the hierarchy but there is some rationale for using the strata for this thesis. First, it is common in national reporting of NDTMS data (e.g. Burkinshaw et al., 2017; Knight et al., 2018; Knight et al., 2017; OHID, 2023d) and so familiar to national policy and decision-makers. Second, there are different individual and social risks, harms and outcomes associated with different substances. Opiate users, for example are more likely to commit crime, have a blood-borne virus and die prematurely than other drug users. Opiate using parents are less likely to be living with their children and, as opiate users are more likely to inject than non-opioid users (OHID, 2023d), their children are more likely to be exposed to potentially harmful drug paraphernalia.

*Figure 2.3‑2 Classification of SUD method schematic, taken from (OHID, 2023d)*



For the quasi-experimental study, the decision was made to group ‘non-opiate only’ and ‘non-opiate and alcohol’ patients together. This was consistent with previous economic modelling provided to local commissioners using the NDTMS (Musto Wright, 2018) which would inform the subsequent third (cost-effectiveness) study, which depended on the results from study 2. Doing so, also reduced the number of models with 20,000 iterations each that would be needed from 16 to 12, thereby substantially lowering the computational power required to generate results. As Figure 2.3‑3 shows, mothers represented half of parents living with children (n=9,124, 50.2%) and under a third of parents not living with children (n=11,473, 29.1%). The data was then further segmented by the three substance groupings: ‘opiate users’ (OUs, n=20,043); ‘non-opiate users’ (non-OUs, n=15,585) and ‘alcohol only’ (n=21,900).

*Figure 2.3‑3 Patient subgroupings (n=57,529)*

### Treatment exposure

In addition to treatment, assignment to the following interventions discussed in chapter 1 were analysed: targeted prevention in the form of ‘parenting and/or family’ recovery support (supporting parenting skills and family relationships) offered by specialist treatment services and targeted ‘early help’ offered by children and family services. Also included were statutory child welfare interventions: children on child in need plans, child protection plans or placed in care.

Parenting and/or family recovery support are reported as two separate interventions in the NDTMS ‘parenting recovery support’ and ‘family recovery support’. A pragmatic decision was made to combine the data into one category to enhance statistical power as the reporting for each individual category was low, and because it would be assumed that there would be overlap between the two in relation to parents. These types of recovery support include arranging therapeutic support for children and other affected family members in their own right, referral to a parenting support worker within the treatment service where available, or to a local partner delivering parenting support (PHE, 2019a).

### Treatment journeys

Consistent with the protocol for reporting of NDTMS data, treatment ‘journeys’ were used to identify periods in and out of treatment for our cohort. Journeys can comprise single or multiple episodes of pharmacological or psychosocial interventions, with any gap between episodes of more than 21 days classified as a new treatment journey. Recovery support services, such as parenting and/or family recovery support, are offered concurrently with treatment or at the end of a treatment episode. Patients are discharged from treatment as having dropped out, died, transferred to another area or prison or left free from being dependent on the substances that brought them into treatment and no longer receiving pharmacological treatment. The latter is known as a ‘successful completion’ in England (PHE, 2019a).

### Outcome variables

The outcome measure for all studies was ‘successful completion of treatment’ for parents or carers with SUD. The NDTMS does not record child outcomes associated with parents being in or having received treatment. I had originally considered measuring changes in child welfare interventions, e.g. the step down from one child welfare intervention to another, such as from child protection to early help, as a proxy for child outcomes, however the data available did not allow for this analysis to be done robustly.

### Data restrictions

Some data restrictions were applied. First, to further protect patient anonymity, only first and second name initials, date of birth, sex and local authority are collected and used to create a patient identifier. This means that any change in any of the identifiers for a person would create a new patient record and as such would be treated as if belonging to a different person. While such a method helps to protect people’s identity on a database which records extremely sensitive information, it could be problematic when analysis is done on, for example, people who are rough sleeping or have unstable housing and so may move around a lot or mothers who get married and change their surname. Issues also arise when a person is recorded by their official name in one treatment service and by their nickname in another.

Second, despite age being available on the NDTMS, only age bands which people belonged to were supplied rather than age to further protect anonymity. This meant, for example, that I was not able to calculate the average age of patients in the dataset and explore meaningfully how this may change for different cohorts. Finally, it was not possible to get intervention start and end dates, meaning that it was not possible to explore the cost-effectiveness of different combinations of interventions making up a treatment journey.

### Missing data

Just over a fifth (22.7%) of the baseline characteristic information were missing from the data extract. To assess whether a multiple imputation (MI) method would be valid for estimating the likelihood of successful completions missing completely at random (MCAR) and covariate-dependent missingness (CDM) tests (Li, 2013) were conducted. Results suggested that the data may be missing at random (MAR), thus MI would be valid, especially as there were enough observations to construct an appropriate model (Hughes et al., 2019). To inform how many imputations would be optimal, relative efficiency (Rubin, 1987) and reduction in statistical power (Graham et al., 2007) were calculated, enhanced by a two-step approach to calculate the point at which the number of imputations resulted in replicable standard error estimates (von Hippel, 2018). Twenty imputations were run. Imputed models were analysed separately, and results combined using Rubin’s rules. Further detail can be found in the next chapter.

## Chapter conclusion

This chapter provided background and context to the design and methodological decisions made for this thesis, alongside overarching methods common to all three studies. The next three chapters comprise three manuscripts prepared for journal publication, including methodological approaches specific to each individual study.

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# Study 1: Exploring characteristics and interventions of parents receiving specialist treatment and child welfare support services in England

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*Target journal: Drug And Alcohol Review (resubmitted)*

## Abstract

**Introduction** There is limited research on which characteristics affect interventions received or outcomes for parents with a substance use disorder. **Methods** Descriptive study of parents in the English treatment system using observational cohort data (April 2017 to January 2020, n=57,529). Associations between interventions plus treatment and treatment completion were estimated using adjusted odds ratios and e-values. **Results** More mothers than fathers lived with children. Subgrouping by parents living with children (LWC) and parents not living with their children (NWC) suggests that LWC were associated with fewer complex support needs, irrespective of sex. LWC were more likely to receive parenting and/or family recovery support plus treatment (mothers aOR=1.76, 95% CI: 1.55,2.00, p<0.001, E=1.98; fathers aOR=1.43, 95% CI: 1.26,1.62,p<0.001, E=1.68) and of statutory child welfare, except for having a child in care (mothers aOR=0.17, 95% CI: 0.13,0.21, E=4.28 ; fathers aOR = 0.33, 95% CI:0.23,0.48, E=2.88). Being LWC was also associated with being more likely to receive early help (mothers aOR=5.62, 95% CI: 4.52,6.99, 4.17 vs fathers aOR = 3.26, 95% CI: 2.71,3.94, E=3.01). Irrespective of sex or child living arrangements, parenting and/or family recovery support offered by a specialist treatment service was significantly associated with successful completion of treatment. E-values ranged from 2.24 to 2.71. The association between integrated early help and statutory child welfare interventions and successful completions was mixed. **Conclusions** Regardless of child living arrangements or sex of parent, all parents in treatment for SUD may benefit from interventions aimed at improving parenting skills and familial relationships.

**Key point summary**

* Parents living with children appear to have fewer complex support needs than parents not living with children.
* Regardless of child living arrangements, parents and carers in treatment for SUD may benefit from targeted prevention interventions aimed at improving parenting skills familial relationships.

**Key words** Parents, substance use disorders, child welfare, treatment, England

## Introduction

Parental substance use disorder (SUD) is associated with poor parenting capacity, sensitivity and attachment (Canfield et al., 2017; Slesnick et al., 2014) – key risk factors of child maltreatment (Hindley et al., 2006; Moreland et al., 2021; Stith et al., 2009) – as well as negative long-lasting child outcomes (Bellis, Hughes, Leckenby, Baban, et al., 2014; Bellis, Hughes, Leckenby, Perkins, et al., 2014; Hughes et al., 2017; Jääskeläinen et al., 2016; McGovern et al., 2023; Mellentin et al., 2016; Moreland et al., 2021). Globally, maternal substance misuse is a factor in 50-80% of childcare proceedings cases and approximately half of mothers receiving SUD treatment have lost the care of at least one child (Canfield et al., 2017; Neo et al., 2021).

In England, support available for families affected by SUD typically includes specialist treatment for parents, targeted prevention and statutory child welfare interventions. Targeted prevention includes interventions such as parenting and/or family recovery support delivered alongside or after completing treatment offered by specialist treatment services, and ‘early help’ offered by children and family services, which can encompass parenting skills and training as well as wider support.

Statutory child welfare services are managed by child social workers and encompass safeguarding assessment, case management and child protection investigations. In England, whether a child receives support from statutory services is determined by both operational and legal thresholds (Hood et al., 2024). If a child is disabled or their development is likely to be impaired or unlikely to be achieved or maintained without intervention, they are classified as a ‘child in need’ under section 17 of the Children Act 1989. Interventions provided vary according to safeguarding risk. If there is no current risk of child maltreatment, a child may be put on a child in need plan, whereas in cases of current or likely future child maltreatment, the child may be put on a child protection plan following a child protection conference under section 47. In extreme cases the child may be removed from their caregivers and placed into care (HM Government, 2018, 2023; Hood et al., 2024)

Studies in this area suggest that mothers who are young, pregnant, have had children removed previously, homeless or in unstable housing, have comorbid mental health problems, unemployed, have had involvement with the criminal justice system, experienced domestic abuse and/or living with more than one child are predictive characteristics of coming to the attention of services (Canfield et al., 2017). As research on parental SUD typically centres on mothers living with their children, little is known about the characteristics of fathers/ parents who do not live with their children. Historical analyses of the English National Drug Treatment Monitoring System (NDTMS) dataset suggest that parents who did not live with their children were more socioeconomically disadvantaged than those who did and were less likely to successfully complete treatment (Meier et al., 2004; NTA, 2012).

Other research using the NDTMS has shown treatment to be effective in reducing SUD. These studies have suggested that pregnancy is associated with increased likelihood of successful treatment completion (Marsden et al., 2012) and, for people with opioid and alcohol use disorders, so does being older, living in stable housing, being employed and not having received treatment previously (Eastwood et al., 2017; Peacock et al., 2018). Moreover, for people with an alcohol use disorder, successful completions has been shown to be enhanced by recovery support interventions (Peacock et al., 2018). These can include help securing accommodation or employment as well as parenting and/or family functioning support. However, whether these considerations are true for all parents is unclear.

In recent years there have been several reviews on SUD, parenting interventions and parental and child outcomes (e.g. McGovern et al., 2023; McGovern et al., 2022; Moreland & McRae-Clark, 2018; Peisch et al., 2018). Reviewers have found that treatment plus parenting and family functioning interventions appear to be more effective than treatment only. In a review of the effectiveness of interventions on cooccurring parental SUD and child maltreatment (Murphy et al., 2017), the authors concluded that the most important aspect for successful treatment and children remaining with their parents was whether parents received individually tailored comprehensive support, irrespective of the type of intervention received. Common among all reviews were authors highlighting the paucity of evidence and emphasising the need for more high-quality research in this area. This is particularly true of UK studies, of which there are few trials or quasi-experimental studies (Barlow et al., 2019; Forrester et al., 2008; Forrester et al., 2014; Whittaker et al., 2022).

This paper aims to explore characteristics and interventions associated with parental status in England. The study is a descriptive and exploratory analysis of the NDTMS administrative dataset in England. In particular, the study focusses on two research questions (RQ):

1. Are parental sex and/or child living arrangements associated with a greater likelihood of receiving treatment plus interventions aimed at protecting or promoting child welfare?
2. Are interventions aimed at protecting or promoting child welfare associated with a greater likelihood of completing treatment successfully?

## Methods

The study is a descriptive and exploratory cohort analysis of the NDTMS administrative dataset. As child welfare data collection began 1 April 2017, data from this point was analysed up to 31 January 2020.

### Dataset, population and setting

The NDTMS is a database which records clinically relevant and socio-demographic data on people receiving treatment for SUD. Data is captured at the start of the alcohol and/ or drug treatment process by treatment practitioners and reviewed regularly (at least every 6 months) by staff with their patients to monitor progress and record any changes, such as parental status. While the treatment and recovery support interventions received would be known to practitioners, recording of information on child welfare support interventions is reliant on patient disclosure.

Figure 3.3‑1 describes the flow of patients included in the final analysis. The population were adults (≥ 18 years) with SUD receiving treatment in all upper-tier English local authorities (n=128,840). Under the NDTMS reporting rules, a ‘parent’ can be a: biological parent, stepparent, foster parent, adoptive parent, guardian or a de facto parent (where a patient has taken on partial or full parenting responsibilities). Patients who had been triaged by a treatment practitioner as requiring treatment but had not actually yet started treatment (n=1,295), and patients with no parental status recorded were excluded (n=2,531). While there are many quality checks on NDTMS data (PHE, 2019b), there is no rule to prevent inconsistent data on families being recorded. For example, an individual can be recorded as a parent living with children in one field and living with 0 children in another during the same timeframe. Such contradictory cases were excluded (n=5,853). Of the cases included, there were 57,529 parents or carers (48.2%) who were categorised into ‘Parent living with children’ (n=18,161, 31.6%) and ‘Parent not living with [any of their] children’ (n=39,368, 68.4%). A parent may not be living with their children this might be because they are separated from their partner, but they may still be in contact, or they may have a child in care. Data was then broken down by sex, with mothers representing half of parents living with children (n=9,124, 50.2%) and under a third of parents not living with children (n=11,473, 29.1%).

*Figure 3.3‑1 Flow diagram of patients included in final analysis*

All triaged patients 1 April 2017 to 31 January 2020 (n=128,840)

Patients who started a treatment intervention (n=127,545)

Patients with parental status recorded (n=125,114)

Patients with no inconsistencies in parental status/ number of children recorded (n=119,261)

Non-parents (n=61,732)

Parents (n=57,529)

Parents living with children (n=18,161)

Parents not living with children (n=39,368)

Men

(n=27,895)

Women (n=11,473)

Men

(n=9,037)

Women

(n=9,124)

### Baseline characteristics and treatment completion variables

The characteristics taken from the NDTMS are listed below. More information on the NDTMS variables used in the study can be found in the ‘Business Definitions’ report (PHE, 2019a). Except for data specific to treatment and recovery support interventions and outcomes, data on the NDTMS is self-reported.

#### Socio-demographic

Patient sex, age category and ethnicity (‘White’ and ‘Black and Asian Minority Ethnic’ [BAME]), pregnancy among females in treatment aged 18-50, number of children living with patient, employment and housing status were available. Employment and housing status were categorised as ‘not in employment, education or training’ (NEET), in ‘employment, education or training’ (EET), and ‘stable housing’, ‘no fixed abode’ (NFA) and ‘housing problem’ (but not NFA) respectively.

#### Clinical

Patients belonged to one of four substance groups (PHE, 2020): opiate users; non-opiate users; non-opiate and alcohol; and alcohol only. Irrespective of other substances used, an opiate user is simply classified as such. In addition, alcohol may be cited as a problem substance in any category but is only separated out in ‘alcohol only’. The strata are consistent with national reporting of NDTMS data and as such are familiar to national policy and decision-makers. Injecting status and mental health treatment need were included as binary variables.

### Treatment exposure

Criminal justice referrals, treatment duration and the number of times patients received treatment during the timeframe were included. It was not possible to distinguish from the data which social care referrals were from adult or child welfare services and, as this field was poorly completed, it was not included. Targeted prevention in the form of ‘parenting and/or family recovery support’ (supporting parenting skills and family relationships) offered by specialist treatment services were included as were child welfare interventions provided by children and family services: targeted ‘early help’ prevention and statutory ‘child in need’, ‘child protection’ and ‘child in care’. Note, statutory child welfare was treated as an intervention rather than an outcome as we were analysing characteristics associated with integrated treatment and child welfare support. Moreover, the data did not allow for changes in child welfare to be measured robustly, e.g. the step down from one child welfare intervention, such as child protection, to another, such as early help.

### Outcome

‘Successful completion of treatment’ was defined as patients who: achieved all their care plan goals and were no longer dependent on the substances that brought them into treatment, nor receiving pharmacological treatment (PHE, 2019a).

### Statistical analysis

All analyses were done in Stata (version 15.1) unless stated otherwise.

#### Descriptive and exploratory analysis of baseline characteristics and interventions received

A multilevel multivariable logistic regression (STATA: *meqrlogit*) was used to estimate the associations between parental sex and/or child living arrangements and the likelihood of receiving treatment plus targeted prevention or statutory child welfare interventions. The socio-demographic and clinical characteristics were Level 1, while the 150 English local authorities were Level 2 (Eastwood et al., 2018; Marsden et al., 2009; Marsden et al., 2012; Peacock et al., 2018; Willey et al., 2016).

#### Analysis of outcomes

The exploratory analysis of baseline characteristics and interventions received suggested that further analysis of the association between successful completion of treatment and interventions, adjusting for baseline characteristics, was warranted. Multicollinearity was assessed using pairwise correlations (STATA: *pwcorr*) and Variance inflation factor (VIF) and R-squared diagnostics (STATA: *collin*). As key data on parents were missing (overall, 22.7%; Table 3.3-1), estimates of successful completion were derived using a multiple imputation model.

*Table 3.3‑1 Summary of missing data in the National Drug Treatment Monitoring System (NDTMS) dataset*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | All parents | | Parents living with children | Parents not living with children |
| Variable | n | % | % | % |
|  |  |  |  |  |
| Overall | 13,056 | 22.7% | 22.8% | 22.7% |
|  |  |  |  |  |
| Child welfare involvement | 6,655 | 13.1% | 10.8% | 11.9% |
| Mental health problem | 4,604 | 8.7% | 9.0% | 7.5% |
| Employment status | 4,213 | 7.9% | 7.6% | 7.2% |
| Ethnicity | 1,750 | 3.1% | 3.4% | 2.9% |
| Housing status | 702 | 1.2% | 1.2% | 1.2% |
| Injecting status | 569 | 1.0% | 1.0% | 1.0% |
| Pregnancy | 293 | 0.5% | 0.7% | 0.4% |
| Referral source | 268 | 0.5% | 0.4% | 0.5% |

#### Handling missing data

Missing completely at random (MCAR) and covariate-dependent missingness (CDM) tests (STATA: *mcartest*) (Li, 2013) assessed the validity of using complete-case analysis (CCA) and multiple imputation (MI) methods for estimating the likelihood of successful completions among parents (Little, 1988). Results indicated that the missing data were not MCAR (X2=849.42, d.f.=460, p-value=0.00). Adding non-missing variables as covariates, was highly nonsignificant (X2=14593.96, d.f.=79580, p-value =1.00) suggesting the data may be missing at random (MAR). CCA without adjusting for the effect of non-missing variables would therefore unlikely be valid, but MI would, especially as there were enough observations to construct an appropriate model (Hughes et al., 2019). Relative efficiency (Rubin, 1987) and reduction in statistical power (Graham et al., 2007) calculations informed how many imputations were needed, enhanced by a two-step approach (STATA: [1] *mi impute chained;* [2] *how\_many\_imputations*) to calculate the point at which the number of imputations resulted in replicable standard error estimates (von Hippel, 2018). 20 imputations were run to achieve a relative efficiency of 99%, reduction of statistical power of <1% and standard error of 5%. Imputed models were analysed separately, and results combined using Rubin’s rules (STATA: *mi impute* *meqrlogit*). CCA and MI results were analysed for comparability (Hughes et al., 2019).

Model discrimination was estimated by c-index and variation by intraclass correlation (ICC).

#### Sensitivity analysis

We estimated the e-value for key results in the study. E-values can assess the robustness of results where confounding is potentially an issue, such as in an exploratory and observational study like ours. The e-value is the minimum adjusted odds ratio an unmeasured confounder would need to be to explain away significant associations observed in the model (Mathur et al., 2018; VanderWeele & Ding, 2017). For example, an indicator of a parent’s motivation to stop using drugs is not captured in NDTMS, however it’s a characteristic which could reasonably affect our results. For every statistically significant estimate of interventions received and successful completion in our study, e-values were calculated to estimate the minimum strength of confounder associations required for the resulting adjusted odds ratios to become nonsignificant, after adjusting for the observed baseline covariates. So, the e-value estimated the strength of association between an unmeasured confounder such as motivation, with our observed characteristics and our significant association. Results close to 1 indicated little unmeasured confounding were necessary to render findings nonsignificant. E-values were calculated using the ‘EValue’ package in R (VanderWeele & Ding, 2017).

## Results

Table 3.4‑1 shows the baseline characteristics of the cohort. Most of the sample were fathers (64.2%), 3.6% of mothers were pregnant. Most mothers were alcohol only users (45.4%), whereas most fathers in the sample were opiate users (36.8%). A higher proportion of mothers than fathers lived with children (44.3% vs 24.5%) and generally mothers had fewer complex support needs. For example, a smaller proportion of mothers than fathers were of no fixed abode (5.9% vs 12.6%), injecting drugs (7.6% vs 10.2%), or had criminal justice referral into treatment (8.8% vs 19.0%). More mothers than fathers, however, had a mental health problem (55.4% vs 43.6%). Table 3.4‑1 also presents the data broken down by parents living with children (LWC) and parents not living with their children (NWC) and shows that a higher proportion of complex support needs are observed among NWC.

*Table 3.4‑1 Baseline characteristics*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Mothers | | | Fathers | | |
| Baseline characteristics | Living with children (LWC) | Not living with their children (NWC) | Overall | Living with children (LWC) | Not living with their children (NWC) | Overall |
| n (%) | n (%) | n (%) | n (%) | n (%) | n (%) |
| *Sociodemographic* |  |  |  |  |  |  |
| Child living arrangements | 9,124 (44.3%) | 11,473 (55.7%) | 20,597 (35.8%) | 9,037 (24.5%) | 27,895 (75.5%) | 36,932 (64.2%) |
| No. of children living with parent: |  |  |  |  |  |  |
| 0 | n/a | 11,473 (100.0%) | 11,473 (55.7%) | n/a | 27,895 (100.0%) | 27,895 (75.5%) |
| 1 | 4,384 (48.0%) | n/a | 4,384 (21.3%) | 3,647 (40.4%) | n/a | 3,647 (9.9%) |
| 2 | 2,994 (32.8%) | n/a | 2,994 (14.5%) | 3,236 (35.8%) | n/a | 3,236 (8.8%) |
| 3+ | 1,746 (19.1%) | n/a | 1,746 (8.5%) | 2,154 (23.8%) | n/a | 2,154 (5.8%) |
| Pregnant | 267 (36.4%) | 467 (63.6%) | 734 (3.6%) | n/a | n/a | n/a |
| Age: |  |  |  |  |  |  |
| 18-24 | 447 (4.9%) | 540 (4.7%) | 987 (4.8%) | 282 (3.1%) | 990 (3.5%) | 1,272 (3.4%) |
| 25-34 | 2,829 (31.0%) | 3,636 (31.7%) | 6,465 (31.4%) | 2,556 (28.3%) | 7,783 (27.9%) | 10,339 (28.0%) |
| 35-44 | 4,199 (46.0%) | 4,130 (36.0%) | 8,329 (40.4%) | 4,214 (46.6%) | 11,489 (41.2%) | 15,703 (42.5%) |
| 45+ | 1,649 (18.1%) | 3,167 (27.6%) | 4,816 (23.4%) | 1,985 (22.0%) | 7,633 (27.4%) | 9,618 (26.0%) |
| BAME | 595 (6.7%) | 624 (5.6%) | 1,219 (6.1%) | 1,101 (12.6%) | 2,520 (9.3%) | 3,621 (10.1%) |
| In employment, education or training | 2,932 (35.1%) | 1,287 (12.2%) | 4,219 (22.3%) | 4,886 (58.0%) | 6,049 (23.3%) | 10,935 (31.8%) |
| NFA | 85 (0.9%) | 1,112 (9.8%) | 1,197 (5.9%) | 103 (1.2%) | 3,487 (12.6%) | 3,590 (9.8%) |
| *Clinical* |  |  |  |  |  |  |
| Substance: |  |  |  |  |  |  |
| Non-opiate user (OU) only | 1,385 (15.2%) | 1,128 (9.8%) | 2,513 (12.2%) | 1,642 (18.2%) | 3,414 (12.2%) | 5,056 (13.7%) |
| Alcohol and non-OU | 1,155 (12.7%) | 1,145 (10.0%) | 2,300 (11.2%) | 1,506 (16.7%) | 4,210 (15.1%) | 5,716 (15.5%) |
| OU | 1,617 (17.7%) | 4,826 (42.1%) | 6,443 (31.3%) | 1,931 (21.4%) | 11,669 (41.8%) | 13,600 (36.8%) |
| Alcohol only | 4,967 (54.4%) | 4,374 (38.1%) | 9,341 (45.4%) | 3,958 (43.8%) | 8,602 (30.8%) | 12,560 (34.0%) |
| Injector | 120 (1.3%) | 1,434 (12.7%) | 1,554 (7.6%) | 234 (2.6%) | 3,484 (12.6%) | 3,718 (10.2%) |
| Mental health problem | 4,192 (50.7%) | 6,274 (59.1%) | 10,466 (55.4%) | 2,819 (34.2%) | 12,024 (46.6%) | 14,843 (43.6%) |
| *Treatment exposure* |  |  |  |  |  |  |
| Criminal justice referral | 255 (2.8%) | 1,553 (13.6%) | 1,808 (8.8%) | 751 (8.3%) | 6,231 (22.5%) | 6,982 (19.0%) |
| Days in treatment: |  |  |  |  |  |  |
| <3m | 2,415 (26.5%) | 2,942 (25.6%) | 5,357 (26.0%) | 2,893 (32.0%) | 8,663 (31.1%) | 11,556 (31.3%) |
| 3-6m | 2,730 (29.9%) | 3,155 (27.5%) | 5,885 (28.6%) | 2,869 (31.7%) | 7,833 (28.1%) | 10,702 (29.0%) |
| 6-12m | 2,070 (22.7%) | 2,498 (21.8%) | 4,568 (22.2%) | 1,723 (19.1%) | 5,211 (18.7%) | 6,934 (18.8%) |
| 12m+ | 1,909 (20.9%) | 2,878 (25.1%) | 4,787 (23.2%) | 1,552 (17.2%) | 6,188 (22.2%) | 7,740 (21.0%) |
| Previous treatment: |  |  |  |  |  |  |
| 0 | 7,531 (82.5%) | 7,763 (67.7%) | 15,294 (74.3%) | 7,545 (83.5%) | 19,923 (71.4%) | 27,468 (74.4%) |
| 1 | 1,402 (15.4%) | 2,831 (24.7%) | 4,233 (20.6%) | 1,287 (14.2%) | 6,023 (21.6%) | 7,310 (19.8%) |
| 2+ | 191 (2.1%) | 879 (7.7%) | 1,070 (5.2%) | 205 (2.3%) | 1,949 (7.0%) | 2,154 (5.8%) |

Building on from Table 3.4‑1, Table 3.4‑2 shows the strength of associations for LWC and NWC, adjusted for baseline characteristics. Among mothers, the LWC subgroup were less likely to be of no fixed abode (aOR=0.14, 95% CI:0.11,0.19, p<0.001), to be injecting (aOR=0.21, 95% CI: 0.16,0.26, p<0.001), or to have a criminal justice referral (aOR=0.31, 95% CI:0.26,0.37, p<0.001) than mothers who were NWC. The same pattern was observed among fathers, although adjusted odds ratios were higher than those observed for mothers.

Mothers who were LWC were less likely to have a mental health problem than mothers who were NWC (aOR=0.81, 95% CI:0.75,0.87, p<0.001), as were fathers who were LWC in comparison with fathers who were NWC (aOR=0.77, 95% CI:0.72,0.82, p<0.001).

*Table 3.4‑2 Baseline characteristics broken down by sex and child living arrangements (n=44,473)*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Baseline characteristics | Mothers (n=15,726) | | Fathers (n=28,747) | |
| NWC = reference case | | NWC = reference case | |
| aOR (95% CI) | Sig. | aOR (95% CI) | Sig. |
|  |  |  |  |  |
| *Socio-demographic* |  |  |  |  |
| Age: |  |  |  |  |
| 18-24^ | 1.00 |  | 1.00 |  |
| 25-34 | 1.25 (1.03-1.51) | p<0.05 | 1.27 (1.05-1.53) | p<0.05 |
| 35-44 | 1.46 (1.21-1.76) | p<0.001 | 1.52 (1.26-1.83) | p<0.001 |
| 45+ | 0.48 (0.40-0.59) | p<0.001 | 0.87 (0.71-1.06) | ns |
| BAME | 1.20 (1.03-1.40) | p<0.05 | 1.36 (1.23-1.51) | p<0.001 |
| Employment, education or training | 2.21 (2.01-2.44) | p<0.001 | 2.51 (2.34-2.69) | p<0.001 |
| NFA | 0.14 (0.11-0.19) | p<0.001 | 0.12 (0.10-0.16) | p<0.001 |
| *Clinical* |  |  |  |  |
| Substance: |  |  |  |  |
| Non-opiate user (OU) only^ | 1.00 |  | 1.00 |  |
| Alcohol and non-OU | 0.81 (0.70-0.94) | p<0.01 | 0.77 (0.70-0.86) | p<0.001 |
| OU | 0.43 (0.37-0.49) | p<0.001 | 0.60 (0.54-0.67) | p<0.001 |
| Alcohol only | 0.95 (0.84-1.07) | ns | 0.98 (0.89-1.08) | ns |
| Injector | 0.21 (0.16-0.26) | p<0.001 | 0.35 (0.30-0.42) | p<0.001 |
| Mental health problem | 0.81 (0.75-0.87) | p<0.001 | 0.77 (0.72-0.82) | p<0.001 |
| *Treatment exposure* |  |  |  |  |
| Criminal justice referral | 0.31 (0.26-0.37) | p<0.001 | 0.48 (0.43-0.53) | p<0.001 |
| Days in treatment: |  |  |  |  |
| <3m^ | 1.00 |  | 1.00 |  |
| 3-6m | 1.07 (0.97-1.18) | ns | 1.06 (0.98-1.14) | ns |
| 6-12m | 1.12 (1.01-1.25) | ns | 1.11 (1.02-1.22) | p<0.05 |
| 12m+ | 1.26 (1.13-1.42) | ns | 1.17 (1.05-1.29) | p<0.01 |
| Previous treatment: |  |  |  |  |
| 0^ | 1.00 |  |  |  |
| 1 | 0.58 (0.53-0.64) | p<0.001 | 0.75 (0.69-0.81) | p<0.001 |
| 2+ | 0.37 (0.30-0.45) | p<0.001 | 0.57 (0.48-0.68) | p<0.001 |

*^ Reference case. Statistical outputs derived from multilevel mixed effect regression models on complete case data (n=44,473) for mothers and fathers, with 150 groups representing English local authorities. Mothers Wald X2 (20) = 2,548.17; Men Wald X2 (19) = 3,437.12*

Table 3.4‑3 shows the proportions and adjusted odds ratios (aORs) of receiving treatment plus targeted prevention in the form of parenting and/or family recovery support offered by treatment services, as well as targeted prevention in the form of ‘early help’, and statutory child welfare interventions. The proportion of people receiving parenting and/or family recovery support was low among both sexes, although a higher proportion of mothers than fathers received the intervention compared with no support, with mothers living with children having the highest proportion (13.7%). The proportion of people receiving targeted prevention and statutory child welfare support was relatively higher. Similarly, a higher proportion of mothers than fathers received child welfare support compared with no support, with mothers living with children having the highest proportion (36.2%).

The following findings were all statistically significant at p<0.001. Compared with parents who were NWC, LWCs were associated with higher odds of receiving parenting and/or family recovery support (mothers aOR=1.76, 95% CI: 1.55,2.00, E=1.98; fathers aOR=1.43, 95% CI: 1.26,1.62, E=1.68) and of children being on child in need and child protection plans (mothers child in need aOR=3.63, 95% CI:2.97,4.43, E=3.22, fathers child in need aOR=2.97, 95% CI: 2.43,3.63 E=2.84; mothers child protection aOR=2.09, 95% CI: 1.80,2.42, E=2.25, fathers child protection aOR=2.00, 95% CI: 1.72,2.33, E=2.18).

Being LWC was also associated with being more likely to receive early help than NWC, with mothers being more statistically likely than fathers (aOR=5.62, 95% CI: 4.52,6.99, E=4.17 vs aOR = 3.26, 95% CI: 2.71,3.94, E=3.01), and being LWC was associated with being less likely to have a child in care, with mothers being statistically less likely than men (aOR=0.17, 95% CI: 0.13,0.21, E=4.28 vs aOR = 0.33, 95% CI:0.23,0.48, E=2.88).

After negative multi-collinearity screening for all baseline characteristics, the results of the multiple imputation exploratory analysis of the association between successful completion of treatment and treatment plus parenting and/or family or child welfare interventions, adjusted for baseline characteristics, can be seen in Table 3.4‑4. Irrespective of sex or whether adults were LWC or NWC, recovery support in the form of parenting and/or family recovery support was significantly associated with successful completion of treatment (mothers LWC aOR=1.66, 95% CI: 1.60,1.72, E=2.71; men LWC aOR=1.45, 95% CI: 1.17,1.78, E=2.26; mothers NWC aOR=1.55, 95% CI: 1.28,1.86, E=2.47; men NWC aOR=1.44, 95% CI: 1.25,1.66, E=2.24).

Compared with no child welfare support, mothers living with children were significantly less likely to successfully complete treatment if they received early help (aOR=0.88, 95% CI: 0.84,0.91, p<0.001, E=1.53), or had a child in care (aOR=0.90, 95% CI: 0.83,0.97, p<0.01, E=1.46), but more likely if they had a child on a child in need plan (aOR=1.18, 95% CI: 1.13-1.22, p<0.001, E=1.64).

Mothers who were NWC were significantly more likely to successfully complete treatment if they had a child on a child protection plan (aOR=1.22, 95% CI: 1.02,1.45, p<0.05, E=1.74). Fathers who were NWC were also more likely to successfully complete if they had a child on a child protection (aOR=1.27, 95% CI: 1.10,1.46, p<0.05, E=1.86), as well as if they were receiving early help support (aOR=1.42, 95% CI: 1.10,1.84, p<0.01, E=2.19).

*Table 3.4‑3 Exploratory analysis of the association between living with children and receiving parenting/ child welfare interventions, broken down by sex and adjusted for baseline characteristics (n=44,473)*

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Interventions | Mothers (n=15,726) | | | | | Fathers (n=28,747) | | | | |
| Parents living with children (LWC) | Parents not living with children (NWC) | aOR (95% CI), LWC = outcome | Sig. | E-value (CI limit) | Parents living with children (LWC) | Parents not living with children (NWC) | aOR (95% CI), LWC = outcome | Sig. | E-value (CI limit) |
|  | n (%) | n (%) | n (%) | n (%) |
| *Recovery support offered by treatment services:* |  |  |  |  |  |  |  |  |  |  |
| No support | 6,003 (86.3%) | 8,037 (91.7%) | 1.00 |  |  | 6,536 (92.4%) | 20,529 (94.7%) | 1.00 |  |  |
| Parenting/family support | 954 (13.7%) | 732 (8.4%) | 1.76 (1.55-2.00) | p<0.001 | 1.98 (1.80) | 536 (7.6%) | 1,146 (5.3%) | 1.43 (1.26-1.62) | p<0.001 | 1.68 (1.49) |
| *Child welfare support from*  *children and family services:* |  |  |  |  |  |  |  |  |  |  |
| No support | 4,439 (63.8%) | 6,374 (72.7%) | 1.00 |  |  | 5,909 (83.6%) | 19,280 (89.0%) | 1.00 |  |  |
| Early help | 596 (8.6%) | 137 (1.6%) | 5.62 (4.52-6.99) | p<0.001 | 4.17 (3.67) | 279 (4.0%) | 269 (1.2%) | 3.26 (2.71-3.94) | p<0.001 | 3.01 (2.68) |
| Child in need plan | 617 (8.9%) | 226 (2.6%) | 3.63 (2.97-4.43) | p<0.001 | 3.22 (2.84) | 295 (4.2%) | 364 (1.7%) | 2.97 (2.43-3.63) | p<0.001 | 2.84 (2.49) |
| Child protection plan | 1,182 (17.0%) | 787 (9.0%) | 2.09 (1.80-2.42) | p<0.001 | 2.25 (2.02) | 529 (7.5%) | 911 (4.2%) | 2.00 (1.72-2.33) | p<0.001 | 2.18 (1.95) |
| Child in care | 123 (1.8%) | 1,245 (14.2%) | 0.17 (0.13-0.21) | p<0.001 | 4.28 (3.79) | 060 (0.9%) | 851 (3.9%) | 0.33 (0.23-0.48) | p<0.001 | 2.88 (2.24) |

*^ Statistical outputs derived from multilevel regression models on complete case data for mothers and fathers, with 150 groups representing English local authorities. Mothers Wald X2 (21) = 582.3; Men Wald X2 (80) = 3,739.94*

*Table 3.4‑4 Exploratory analysis of the association between successful completion of treatment and receiving parenting and/or family recovery support and child welfare interventions, adjusted for baseline characteristics, using multiple imputation models (n=57,529)*

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Child living arrangements | Interventions | Mothers | | | Fathers | | |
| aOR (95% CI) | Sig | E-value (CI limit) | aOR (95% CI) | Sig | E-value (CI limit) |
| Parents living with children (LWC) |  |  |  |  |  |  |  |
| *Recovery support offered by*  *treatment services* |  |  |  |  |  |  |
| Parenting and/or family support | 1.66 (1.60-1.72) | p<0.001 | 2.71 (2.58) | 1.45 (1.18-1.78) | p<0.001 | 2.26 (1.64) |
| *Child welfare support offered by*  *children and family services:* |  |  |  |  |  |  |
| No support | 1.00 |  |  | 1.00 |  |  |
| Early help | 0.88 (0.84-0.91) | p<0.001 | 1.53 (1.42) | 0.96 (0.74-1.23) | ns | n/a |
| Child in need plan | 1.18 (1.13-1.22) | p<0.001 | 1.64 (1.51) | 1.17 (0.92-1.50) | ns | n/a |
| Child protection plan | 1.03 (1.00-1.06) | ns | n/a | 1.14 (0.94-1.38) | ns | n/a |
| Child in care | 0.90 (0.83-0.97) | p<0.01 | 1.46 (1.21) | 1.09 (0.62-1.93) | ns | n/a |
|  |  |  |  |  |  |  |
| Parents not living with children (NWC) | *Recovery support offered by*  *treatment services* |  |  |  |  |  |  |
| Parenting and/or family support | 1.55 (1.28-1.86) | p<0.001 | 2.47 (1.88) | 1.44 (1.25-1.66) | p<0.001 | 2.24 (1.81) |
| *Child welfare support offered by*  *children and family services:* |  |  |  |  |  |  |
| No support | 1.00 |  |  | 1.00 |  |  |
| Early help | 1.36 (0.94-1.97) | ns | n/a | 1.42 (1.10-1.84) | p<0.01 | 2.19 (1.43) |
| Child in need plan | 1.19 (0.89-1.59) | ns | n/a | 1.23 (0.98-1.54) | ns | n/a |
| Child protection plan | 1.22 (1.02-1.45) | p<0.05 | 1.74 (1.16) | 1.27 (1.10-1.46) | p<0.01 | 1.86 (1.43) |
| Child in care | 0.92 (0.78-1.07) | ns | n/a | 0.87 (0.72-1.03) | ns | n/a |
|  |  |  |  |  |  |  |

*^ Statistical outputs derived from multiple imputation models. Mothers LWC: Wald X2(33) = 1087.52, c-index = 0.267 (95% CI: 0.172,0.412), ICC= 0.774 (95% CI: 0.771, 0.778); Mothers NWC: Wald X2(31) 2088.80, c-index = 0.273 (95% CI: 0.174,0.425); ICC= 0.774 (95% CI: 0.771, 0.778); Men LWC: Wald X2(32) = 1138.06, c-index = 0.045 (95% CI: 0.031,0.064); ICC= 0.772 (95% CI: 0.767, 0.776); Men NWC: Wald X2(30) = 4455.93, c-index = 0.034 (95% CI: 0.025,0.045); ICC= 0.772 (95% CI: 0.767, 0.776)*

## Discussion

This is the first descriptive study to focus on parents and carers in the English treatment system and explore characteristics of receiving parenting and/or family recovery support offered by specialist treatment or non-statutory and statutory child welfare interventions offered by children and family services, alongside likelihood of completing treatment. Our findings suggest that parents are not a homogenous group. Fathers were associated with more complex support needs than mothers, however the greatest differences observed were between parents living with children and parents not living with children, with the former having the least complex support needs irrespective of sex. c

Currently just 10.7% of mothers and 5.9% of fathers receive parenting and/or family recovery support offered by treatment services, with even smaller proportions among those not living with their children, yet this is consistently associated with greater likelihood of successful completion. Our findings therefore suggest that treatment practitioners could potentially be offering more parenting and/or family recovery support interventions to both parents not living with children as well as those living with children. However, further analysis is required to further explore where this might be more appropriate to do so.

It is perhaps not surprising that a higher proportion of parents living with children received treatment plus a parenting and/or family recovery support or child welfare intervention (with the exception of having a child in care), with mothers being most likely. It is interesting to note, however, that compared with no integrated support, both men and mothers who lived with children and received targeted prevention in the form of ‘early help’ were less likely to successfully complete treatment, whereas those who received targeted prevention in the form of parenting and/or family recovery support were more likely to successfully complete. On the other hand, for fathers not living with children, targeted prevention in the form of both early help and parenting and/or family recovery support interventions were associated with successful completion of treatment. While ‘early help’ can include parenting skills and improving familial relationships, it is not possible to know from the available data what ‘early help’ encompassed, and so the reasons for our ‘early help’ findings warrant further investigation. Further, results on whether integrated statutory child welfare was associated with successful completion were mixed. As this is a descriptive study, results should be interpreted with caution, and further research to estimate effects adjusting as fully as possible for confounders is a priority.

The use of treatment completion, or ‘successful completion’, as the sole outcome measure is a limitation of the study as SUD is a chronic health condition which can involve multiple episodes of treatment, abstinence and relapse, which in turn may affect parenting capability over time. Moreover, it can be clinically appropriate for individuals to receive ongoing pharmacological therapy and for them to be monitored in a clinical setting. While this might constitute a successful outcome for parents and children, the main outcome measure in the English system is treatment completion. Therefore, by using successful completion of treatment, we are using measures understood by English decision and policymakers and making the study comparable with other international evidence.

Findings suggest that the available data is worth exploring further. As our study examines parental outcomes only, a key research priority would be to measure longitudinal child welfare outcomes using NDTMS data matched with children’s social care data, or via the use of validated questionnaires, such as the Brief Child Abuse Potential (BCAP) Inventory (Ondersma et al., 2005). Comparisons such as comparing pregnant women with an alcohol user disorder to fathers not living with children with an opiate use disorder would be helpful in emphasising the differences among parents and how this might inform practice.

As this study was designed to be descriptive of characteristics, interventions and outcomes, it is subject to confounding and results should be interpreted with caution. Future research could improve generalisability by adopting a quasi-experimental approach to compare treatment outcomes for parents, such as a propensity score analysis. Given the dearth of research on interventions for parents with SUD in England, we hope that the findings of this study regarding the types of parent who may benefit from treatment and targeted prevention in the form of parenting and/or family recovery support might represent a useful contribution to the field.

## Conclusion

This is the first study to focus on parents in the English treatment system and explore characteristics associated with child welfare interventions and treatment completion. Our findings suggest that parents with SUD are not a homogenous group, and that treatment alongside targeted prevention in the form parenting and/or family recovery support could potentially benefit parents regardless of child living arrangements. As this is a descriptive study, results should be interpreted with caution, and further research to estimate effects adjusting as fully as possible for confounders is a priority.

## Supplementary analysis

This section presents useful information that was not included in the journal paper submission as the suggested a narrower focus for resubmission, separating out fathers and mothers. Discussion on the findings below (interpretation and contextualising) can be found in chapter 6.

Table 3.7‑1 shows the baseline characteristics of parents and non-parents. Over half of the sample were not parents (NP, 51.8%), followed by parents not living with their children (NWC, 33.0%) and parents living with children (LWC, 15.2%). Parents not living with children appeared to be the most complex group of the three. Characteristics significantly associated with this group were: being pregnant (LWC=1.5%, NWC= 1.2%, Relative Risk Ratio [RRR]=1.47, 95% CI: 1.16-1.85, p<0.01, NP=0.5%, RRR=0.86, 95% CI: 0.67-1.09, p<0.01); having a housing problem (LWC=6.6%, NWC= 14.9%, RRR=2.26 95% CI: 2.08-2.46, p<0.01, NP=10.1%, RRR=1.71, 95% CI: 1.55-1.88, p<0.01); a criminal justice referral (LWC=5.5%, NWC= 19.8%, RRR=2.21 95% CI: 1.99-2.46, p<0.01); and being in treatment once before during the reporting period (LWC=14.8%, NWC=22.5%, RRR=1.43, 95% CI=1.34-1.52, p<0.01, NP=19.0%, RRR=1.25, 95% CI=1.17-1.34, p<0.01).

Table 3.7‑2 shows that mothers were significantly more likely to receive any kind of integrated support irrespective of whether they lived with children or not (all child welfare categories p<0.01). Being older than 18-24 was associated with reduced likelihood, e.g. parents living with children in the 35-44 age category were less than half as likely as 18-24 year olds to receive early help (RRR=0.45, 95% CI: 0.31-0.65, p<0.01), or having a child categorised as ‘in need’ (RRR=0.44, 95% CI: 0.31-0.63, p<0.01) than no integrated support. Parents receiving parenting and/or family recovery support as part of their treatment intervention, were more likely to also be receiving early help, child in need or child protection child welfare support (all p<0.01).

Parents living with more than one child were significantly more likely to receive early help, child in need or child protection child welfare support, with relative risk increasing the more children were at home. For example, those living with two children were 1.16 times more likely to have a child on a protection plan than be in receipt of treatment alone (95% CI: 1.02-1.32, p<0.05), while those with three or more children were 1.75 times more likely (95% CI: 1.53-1.99, p<0.01). Parents who lived with children and who injected drugs were more likely to have a child looked after (RRR=2.93, 95% CI: 1.49-5.77, p<0.01), as were those in receipt of domestic abuse recovery support (RRR=2.54, 95% CI: 1.07-6.03, p<0.05) or inpatient rehabilitation (RRR=2.06, 95% CI: 1.21-3.49, p<0.01).

*Table 3.7‑1 Baseline characteristics and interventions received of study cohort (n=119,261)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | |  | *Parent* | | | *Not a parent (NP)* | | |  | *Living with child (LWC)* ¥ | *Not living with child (NWC)* | | | *Baseline characteristics and interventions* | *n (%)* | *n (%)* | *RRR (95% CI)* | *n (%)* | *RRR (95% CI)* | | Number of patients | 18,161(100.0) | 39,638(100.0) |  | 61,732(100.0) |  | | *Socio-demographic* |  |  |  |  |  | | Pregnancy status: |  |  |  |  |  | | Not pregnant¥ | 17,768 (97.8) | 38,734 (98.4) | 1.00 | 61,113 (99.0) | 1.00 | | Pregnant | 267 (1.5) | 467 (1.2) | 1.47 (1.16-1.85)\*\* | 311 (0.5) | 0.86 (0.67-1.09) | | Age: |  |  |  |  |  | | 18-24¥ | 729 (4.0) | 1,530 (3.9) | 1.00 | 6,979 (11.3) | 1.00 | | 25-34 | 5,385 (29.7) | 11,419 (29.0) | 0.68 (0.59-0.79)\*\* | 14,752 (23.9) | 0.18 (0.16-0.20)\*\* | | 35-44 | 8,413 (46.3) | 15,619 (39.7) | 0.51 (0.44-0.59)\*\* | 16,876 (27.3) | 0.10 (0.09-0.11)\*\* | | 45+ | 3,634 (20.0) | 10,800 (27.4) | 1.03 (0.86-1.22) | 23,125 (37.5) | 0.33 (0.29-0.38)\*\* | | Sex: |  |  |  |  |  | | Male¥ | 9,037 (49.8) | 27,895 (70.9) | 1.00 | 45,023 (72.9) |  | | Female | 9,124 (50.2) | 11,473 (29.1) | 0.42 (0.40-0.44)\*\* | 16,709 (27.1) | 0.44 (0.42-0.47)\*\* | | Ethnicity: |  |  |  |  |  | | White¥ | 15,852 (87.3) | 35,087 (89.1) | 1.00 | 53,856 (87.2) | 1.00 | | BAME | 1,696 (9.3) | 3,144 (8.0) | 0.77 (0.69-0.86)\*\* | 5,788 (9.4) | 0.93 (0.84-1.04) | | Employment status: |  |  |  |  |  | | NEET ¥ | 6,003 (33.1) | 16,675 (42.4) | 1.00 | 22,841 (37.0) | 1.00 | | Disabled | 2,962 (16.3) | 12,522 (31.8) | 1.55 (1.42-1.68)\*\* | 17,497 (28.3) | 1.57 (1.45-1.71)\*\* | | EET | 7,818 (43.0) | 7,336 (18.6) | 0.45 (0.42-0.48)\*\* | 15,967 (25.9) | 0.53 (0.50-0.57)\*\* | | Housing status: |  |  |  |  |  | | No housing problem¥ | 16,569 (91.2) | 28,429 (72.2) | 1.00 | 49,225 (79.7) | 1.00 | | NFA | 188 (1.0) | 4,599 (11.7) | 6.97 (5.65-8.60)\*\* | 4,604 (7.5) | 5.28 (4.29-6.50)\*\* | | Housing problem | 1,191 (6.6) | 5,851 (14.9) | 2.26 (2.08-2.46)\*\* | 6,264 (10.1) | 1.71 (1.55-1.88)\*\* | | *Clinical* |  |  |  |  |  | | Substance: |  |  |  |  |  | | Non-opiate user (OU) only¥ | 3,027 (16.7) | 4,542 (11.5) | 1.00 | 7,728 (12.5) | 1.00 | | Alcohol and non-OU | 2,661 (14.7) | 5,355 (13.6) | 1.24 (1.15-1.34)\*\* | 9,122 (14.8) | 1.26 (1.17-1.37)\*\* | | OU | 3,548 (19.5) | 16,495 (41.9) | 1.60 (1.45-1.76)\*\* | 19,728 (32.0) | 1.56 (1.39-1.75)\*\* | | Alcohol only | 8,925 (49.1) | 12,976 (33.0) | 0.97 (0.89-1.05) | 25,154 (40.7) | 1.11 (1.02-1.20)\* | | Injecting status: |  |  |  |  |  | | Non-injector¥ | 17,621 (97.0) | 34,067 (86.5) | 1.00 | 54,653 (88.5) | 1.00 | | Injector | 354 (1.9) | 4,918 (12.5) | 3.28 (2.86-3.76)\*\* | 5,430 (8.8) | 3.10 (2.69-3.57)\*\* | | Co-morbidity: |  |  |  |  |  | | No mental health problem¥ | 9,511 (52.4) | 18,105 (46.0) | 1.00 | 30,135 (48.8) | 1.00 | | Mental health problem | 7,011 (38.6) | 18,298 (46.5) | 1.23 (1.17-1.29)\*\* | 26,957 (43.7) | 1.16 (1.10-1.23)\*\* | | *Treatment exposure* |  |  |  |  |  | | Referral source: |  |  |  |  |  | | Non-CJS referral¥ | 17,089 (94.1) | 31,382 (79.7) | 1.00 | 53,285 (86.3) | 1.00 | | Criminal Justice System (CJS) referral | 1,006 (5.5) | 7,784 (19.8) | 2.21 (1.99-2.46)\*\* | 8,202 (13.3) | 1.71 (1.53-1.90)\*\* | | Days in treatment: |  |  |  |  |  | | <3m¥ | 5,308 (29.2) | 11,605 (29.5) | 1.00 | 18,876 (30.6) | 1.00 | | 3-6m | 5,599 (30.8) | 10,988 (27.9) | 0.95 (0.90-1.01) | 17,796 (28.8) | 0.96 (0.91-1.01) | | 6-12m | 3,793 (20.9) | 7,709 (19.6) | 0.91 (0.85-0.98)\* | 11,988 (19.4) | 0.97 (0.91-1.04) | | 12m+ | 3,461 (19.1) | 9,066 (23.0) | 0.85 (0.78-0.92)\*\* | 13,072 (21.2) | 0.93 (0.85-1.02) | | Previous treatment: |  |  |  |  |  | | 0¥ | 15,076 (83.0) | 27,686 (70.3) | 1.00 | 46,954 (76.1) | 1.00 | | 1 | 2,689 (14.8) | 8,854 (22.5) | 1.43 (1.34-1.52)\*\* | 11,723 (19.0) | 1.25 (1.17-1.34)\*\* | | 2+ | 396 (2.2) | 2,828 (7.2) | 1.94 (1.71-2.19)\*\* | 3,055 (4.9) | 1.67 (1.48-1.89)\*\* | | *Interventions* |  |  |  |  |  | | Outpatient pharmacological | 4,662 (25.7) | 17,023 (43.2) | 1.02 (0.94-1.11) | 21,377 (34.6) | 0.94 (0.85-1.03) | | Outpatient psychosocial | 17,698 (97.5) | 37,999 (96.5) | 1.04 (0.72-1.51) | 58,608 (94.9) | 0.91 (0.72-1.15) | | Inpatient detoxification | 495 (2.7) | 1,324 (3.4) | 1.24 (1.05-1.46)\* | 2,410 (3.9) | 1.26 (1.09-1.45)\*\* | | Residential rehabilitation | 353 (1.9) | 897 (2.3) | 1.01 (0.80-1.27) | 1,630 (2.6) | 1.11 (0.92-1.34) | | Recovery support: |  |  |  |  |  | | Parenting/ family support | 1,805 (9.9) | 2,276 (5.8) | 0.58 (0.52-0.65)\*\* | 2,724 (4.4) | 0.47 (0.41-0.54)\*\* | | Housing/ employment | 992 (5.5) | 3,275 (8.3) | 1.61 (1.42-1.82)\*\* | 4,709 (7.6) | 1.66 (1.48-1.86)\*\* | | Domestic abuse | 199 (1.1) | 440 (1.1) | 1.36 (1.11-1.68)\*\* | 417 (0.7) | 1.05 (0.83-1.31) | | Child welfare support: |  |  |  |  |  | | No support¥ | 11,882 (65.4) | 29,160 (74.1) | 1.00 | 61,732 (100.0) | n/a | | Early help | 1,034 (5.7) | 474 (1.2) | 0.23 (0.20-0.26)\*\* | n/a | n/a | | Child in need | 1,067 (5.9) | 679 (1.7) | 0.30 (0.26-0.34)\*\* | n/a | n/a | | Child protection | 2,009 (11.1) | 1,959 (5.0) | 0.45 (0.40-0.51)\*\* | n/a | n/a | | Child looked after | 209 (1.2) | 2,401 (6.1) | 4.43 (3.47-5.64)\*\* | n/a | n/a | |  |  |  |  |  |  | |  |  |  |  |  |

¥ = referent; significance at \*\* p<0.01 and \* p<0.05. Multinomial logistic regression; RRR = adjusted relative risk ratio; CI = confidence intervals. Wald X2 (d.f.=64) models tested significant at p = 0.000. Log R2=0.1637. Standard errors were adjusted for 150 clusters in each local authority

*Table 3.7‑2 Characteristics associated with a greater likelihood of receiving concurrent treatment and child welfare support: comparison of treatment alone (reference case) with 1) treatment and early help, 2) treatment and child in need support, 3) treatment and child protection plan and 4) treatment and child looked after*

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| *Baseline characteristics and interventions* | *Parents living with children (LWC, n=14,062)* | | | | *Parents not living with children (NWC, n=30,444)* | | | |
| *Concurrent treatment and Early help RRR (95% CI)* | *Concurrent treatment and Child in need RRR (95% CI)* | *Concurrent treatment and Child protection plan RRR (95% CI)* | *Concurrent treatment and Child looked after RRR (95% CI)* | *Concurrent treatment and Early help RRR (95% CI)* | *Concurrent treatment and Child in need RRR (95% CI)* | *Concurrent treatment and Child protection plan RRR (95% CI)* | *Concurrent treatment and Child looked after RRR (95% CI)* |
|  |  |  |  |  |  |  |  |  |
| *Socio-demographic* |  |  |  |  |  |  |  |  |
| No. of children living with parent: |  |  |  |  |  |  |  |  |
| 1¥ | 1.00 | 1.00 | 1.00 | 1.00 | n/a | n/a | n/a | n/a |
| 2 | 1.27 (1.09-1.48)\*\* | 1.07 (0.92-1.25) | 1.16 (1.02-1.32)\* | 0.56 (0.39-0.81)\*\* | n/a | n/a | n/a | n/a |
| 3+ | 1.76 (1.47-2.11)\*\* | 1.48 (1.25-1.76)\*\* | 1.75 (1.53-1.99)\*\* | 0.73 (0.49-1.11) | n/a | n/a | n/a | n/a |
| Pregnancy status: |  |  |  |  |  |  |  |  |
| Not pregnant¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Pregnant | 0.63 (0.35-1.14) | 1.34 (0.78-2.31) | 1.14 (0.76-1.70) | 1.10 (0.37-3.25) | 3.01 (1.83-4.95)\*\* | 1.63 (0.93-2.87) | 2.27 (1.65-3.13)\*\* | 1.48 (1.10-2.00)\* |
| Age: |  |  |  |  |  |  |  |  |
| 18-24¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 25-34 | 0.58 (0.41-0.83)\*\* | 0.54 (0.38-0.77)\*\* | 0.59 (0.46-0.76)\*\* | 0.59 (0.28-1.25) | 0.66 (0.46-0.95)\* | 1.03 (0.68-1.56) | 0.74 (0.60-0.91)\*\* | 0.66 (0.54-0.80)\*\* |
| 35-44 | 0.45 (0.31-0.65)\*\* | 0.44 (0.31-0.63)\*\* | 0.36 (0.27-0.47)\*\* | 0.51 (0.24-1.12) | 0.34 (0.22-0.52)\*\* | 0.64 (0.44-0.94)\* | 0.39 (0.32-0.48)\*\* | 0.50 (0.41-0.61)\*\* |
| 45+ | 0.29 (0.19-0.44)\*\* | 0.25 (0.17-0.37)\*\* | 0.21 (0.16-0.29)\*\* | 0.55 (0.24-1.28) | 0.13 (0.08-0.20)\*\* | 0.13 (0.08-0.22)\*\* | 0.07 (0.06-0.10)\*\* | 0.15 (0.12-0.20)\*\* |
| Sex: |  |  |  |  |  |  |  |  |
| Male¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Female | 2.47 (2.08-2.93)\*\* | 2.20 (1.86-2.61)\*\* | 2.37 (2.10-2.68)\*\* | 2.48 (1.80-3.41)\*\* | 1.48 (1.17-1.88)\*\* | 2.00 (1.69-2.35)\*\* | 2.51 (2.23-2.83)\*\* | 4.25 (3.78-4.78)\*\* |
| Ethnicity: |  |  |  |  |  |  |  |  |
| White¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| BAME | 1.17 (0.93-1.48) | 1.11 (0.83-1.48) | 1.14 (0.90-1.43) | 1.07 (0.68-1.70) | 1.09 (0.74-1.61) | 0.80 (0.54-1.18) | 1.02 (0.83-1.25) | 0.95 (0.73-1.24) |
| Employment status: |  |  |  |  |  |  |  |  |
| NEET¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Disabled | 1.18 (0.98-1.42) | 1.04 (0.87-1.25) | 1.04 (0.90-1.20) | 0.96 (0.66-1.41) | 0.83 (0.65-1.06) | 0.97 (0.79-1.18) | 0.93 (0.81-1.05) | 1.05 (0.93-1.19) |
| EET | 0.55 (0.46-0.67)\*\* | 0.46 (0.38-0.56)\*\* | 0.33 (0.28-0.39)\*\* | 0.47 (0.31-0.72)\*\* | 1.05 (0.81-1.35) | 0.98 (0.77-1.24) | 0.69 (0.59-0.80)\*\* | 0.50 (0.42-0.59)\*\* |
| Housing status: |  |  |  |  |  |  |  |  |
| No housing problem¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| NFA | 1.46 (0.80-2.66) | 1.71 (1.00-2.94) | 1.60 (0.91-2.79) | 1.34 (0.52-3.48) | 0.64 (0.42-0.98)\* | 1.20 (0.92-1.58) | 1.07 (0.91-1.27) | 1.12 (0.96-1.29) |
| Housing problem | 1.36 (1.03-1.79)\* | 1.69 (1.30-2.20)\*\* | 1.93 (1.58-2.35)\*\* | 2.24 (1.45-3.44)\*\* | 1.48 (1.18-1.86)\*\* | 1.19 (0.94-1.52) | 1.34 (1.16-1.55)\*\* | 1.19 (1.05-1.34)\*\* |
| *Clinical* |  |  |  |  |  |  |  |  |
| Substance: |  |  |  |  |  |  |  |  |
| Non-opiate user (OU) only¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Alcohol and non-OU | 0.85 (0.66-1.11) | 0.80 (0.64-1.00) | 0.70 (0.58-0.85)\*\* | 0.91 (0.52-1.59) | 0.77 (0.55-1.08) | 0.69 (0.52-0.93)\* | 0.71 (0.61-0.84)\*\* | 0.69 (0.56-0.84)\*\* |
| OU | 0.67 (0.49-0.90)\*\* | 0.76 (0.57-1.02) | 0.58 (0.45-0.75)\*\* | 1.01 (0.55-1.87) | 0.55 (0.35-0.88)\* | 0.38 (0.26-0.54)\*\* | 0.48 (0.39-0.58)\*\* | 0.76 (0.60-0.97)\* |
| Alcohol only | 0.91 (0.73-1.13) | 0.78 (0.63-0.96)\* | 0.59 (0.50-0.70)\*\* | 0.64 (0.38-1.08) | 0.76 (0.55-1.05) | 0.71 (0.55-0.91)\*\* | 0.62 (0.52-0.74)\*\* | 0.48 (0.40-0.58)\*\* |
| Injecting status: |  |  |  |  |  |  |  |  |
| Non-injector¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Injector | 1.29 (0.68-2.47) | 1.06 (0.61-1.84) | 1.00 (0.68-1.47) | 3.03 (1.55-5.94)\*\* | 0.77 (0.52-1.15) | 0.76 (0.53-1.09) | 0.76 (0.60-0.96)\* | 0.99 (0.87-1.13) |
| Co-morbidity: |  |  |  |  |  |  |  |  |
| No mental health problem¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Mental health problem | 1.16 (1.02-1.32)\* | 1.01 (0.87-1.18) | 0.90 (0.80-1.01) | 0.85 (0.62-1.15) | 1.03 (0.84-1.26) | 0.94 (0.79-1.12) | 0.76 (0.60-0.96)\* | 1.14 (1.02-1.26)\* |
| *Treatment exposure* |  |  |  |  |  |  |  |  |
| Referral source: |  |  |  |  |  |  |  |  |
| Non-criminal justice referral¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| Criminal justice referral | 0.82 (0.57-1.19) | 0.76 (0.51-1.14) | 0.77 (0.58-1.03) | 1.27 (0.74-2.18) | 0.80 (0.58-1.12) | 1.26 (1.03-1.54)\* | 0.85 (0.73-1.00)\* | 1.19 (1.05-1.36)\*\* |
| Days in treatment: |  |  |  |  |  |  |  |  |
| <3m¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 3-6m | 1.11 (0.91-1.35) | 1.07 (0.89-1.28) | 1.10 (0.95-1.27) | 1.24 (0.86-1.77) | 1.29 (1.00-1.66) | 0.93 (0.75-1.16) | 1.16 (1.00-1.35)\* | 0.93 (0.82-1.05) |
| 6-12m | 1.16 (0.93-1.45) | 1.33 (1.09-1.62)\*\* | 1.49 (1.25-1.77)\*\* | 1.19 (0.76-1.86) | 1.18 (0.82-1.69) | 1.13 (0.88-1.45) | 1.41 (1.21-1.65)\*\* | 1.03 (0.89-1.19) |
| 12m+ | 1.15 (0.88-1.50) | 1.46 (1.12-1.90)\*\* | 1.43 (1.19-1.73)\*\* | 0.74 (0.44-1.24) | 1.76 (1.25-2.49)\*\* | 1.04 (0.80-1.37) | 1.34 (1.11-1.63)\*\* | 0.94 (0.81-1.11) |
| Previous treatment: |  |  |  |  |  |  |  |  |
| 0¥ | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 | 1.00 |
| 1 | 1.28 (1.03-1.58)\* | 1.67 (1.38-2.03)\*\* | 1.24 (1.07-1.44)\*\* | 1.37 (0.86-2.17) | 0.99 (0.76-1.27) | 1.17 (0.97-1.41) | 1.02 (0.89-1.17) | 1.08 (0.94-1.24) |
| 2+ | 1.55 (1.05-2.28)\* | 1.74 (1.14-2.67)\* | 1.62 (1.16-2.26)\*\* | 2.09 (1.11-3.95)\* | 1.13 (0.76-1.67) | 1.05 (0.74-1.49) | 0.71 (0.53-0.93)\* | 1.10 (0.88-1.37) |
| *Interventions* |  |  |  |  |  |  |  |  |
| Outpatient pharmacological | 0.75 (0.61-0.93)\*\* | 0.52 (0.41-0.67)\*\* | 0.59 (0.47-0.73)\*\* | 0.69 (0.45-1.05) | 0.53 (0.36-0.79)\*\* | 0.90 (0.68-1.20) | 0.68 (0.58-0.81)\*\* | 0.86 (0.72-1.02) |
| Outpatient psychosocial | 1.36 (0.72-2.58) | 1.98 (0.91-4.31) | 1.16 (0.75-1.78) | 0.54 (0.31-0.95)\* | 1.44 (0.62-3.34) | 4.06 (1.44-11.43)\*\* | 1.15 (0.82-1.61) | 1.50 (1.05-2.14)\* |
| Inpatient detoxification | 0.76 (0.42-1.37) | 0.51 (0.34-0.76)\*\* | 0.47 (0.33-0.68)\*\* | 0.42 (0.13-1.34) | 0.72 (0.39-1.35) | 0.61 (0.29-1.27) | 0.86 (0.64-1.15) | 1.02 (0.77-1.35) |
| Inpatient rehabilitation | 0.60 (0.28-1.26) | 0.68 (0.35-1.30) | 0.55 (0.36-0.85)\*\* | 2.06 (1.21-3.49)\*\* | 1.46 (0.83-2.58) | 1.10 (0.60-2.02) | 0.79 (0.51-1.21) | 0.75 (0.53-1.06) |
| Recovery support: |  |  |  |  |  |  |  |  |
| Parenting and/or family | 1.82 (1.41-2.35)\*\* | 2.48 (1.94-3.17)\*\* | 0.00 (0.00-0.00)\*\* | 1.59 (0.98-2.58) | 2.14 (1.56-2.93)\*\* | 2.64 (1.87-3.74)\*\* | 2.13 (1.68-2.71)\*\* | 1.45 (1.17-1.79)\*\* |
| Housing/ employment | 0.88 (0.64-1.21) | 0.64 (0.48-0.86)\*\* | 0.93 (0.73-1.18) | 0.58 (0.28-1.21) | 0.98 (0.71-1.36) | 0.74 (0.52-1.06) | 0.60 (0.46-0.78)\*\* | 0.94 (0.78-1.14) |
| Domestic abuse | 0.66 (0.31-1.37) | 1.28 (0.72-2.29) | 1.34 (0.81-2.23) | 2.54 (1.07-6.03)\* | 0.33 (0.10-1.12) | 0.89 (0.45-1.77) | 1.01 (0.65-1.57) | 1.17 (0.84-1.62) |
|  |  |  |  |  |  |  |  |  |

As can be seen in Table 3.7‑3 the relationship between age and successful completion of treatment was mostly nonsignificant, apart from parents not living with children aged 45+ were more likely to complete treatment than their 18-24-year old counterparts (aOR=1.33, 95% CI: 1.17-1.52, p<0.0, E= 1.57 [uncertainty estimate =1.37]). Mothers were significantly more likely to complete treatment than fathers (aOR=1.11, 95% CI: 1.06-1.16, p<0.01, E= 1.29 [uncertainty estimate =1.20]). Mothers not living with children *and* pregnant were more likely to complete treatment than those who were not pregnant (aOR=1.42, 95% CI: 1.14-1.78, p<0.01, E= 1.67 [uncertainty estimate =1.34]).

Just 2.3% of parents received residential rehabilitation, but all parents who received residential rehabilitation were more likely to complete than not (aOR=2.95, 95% CI 2.57-3.39, p<0.01, E= 2.83 [uncertainty estimate =2.59]), with likelihood notably greater for parents not living with children (LWC aOR=2.05, 95% CI: 1.59-2.65, p<0.01; E= 2.22 [uncertainty estimate =1.83]; NWC aOR=3.46, 95% CI: 2.94-4.09, p<0.01, E= 3.12 [uncertainty estimate =2.82]). This association was larger than the association for outpatient treatment, or for inpatient detoxification.

Parenting and/or family and housing/employment recovery support delivered alongside treatment were associated with greater likelihood of completion (aOR=1.54, 95% CI: 1.41-1.67, p<0.01, E= 1.79 [uncertainty estimate =1.66]; aOR=1.37, 95% CI: 1.26-1.49, p<0.01, E= 1.61 [uncertainty estimate =1.49]); domestic abuse interventions were not a predictor of treatment completion.

Those who were employed or in education/ training were more likely to complete treatment than those who were not (aOR=1.33, 95% CI: 1.27-1.40, p<0.01, E=1.57 [uncertainty estimate = 1.51]). No previous treatment journeys within the study timeframe was associated with completion, with the higher the number of journeys associated with less chance of success (once before aOR=0.47, 95% CI: 0.44-0.49, p<0.01, E=2.28 [uncertainty estimate = 2.21]; 2+ aOR=0.25, 95% CI: 0.22-0.28, p<0.01, E=3.41 [uncertainty estimate = 3.19]).

*Table 3.7‑3 Predictors of completion of treatment. Treatment completion (reference case) for all parents, parents living with children and parents not living with children*

|  |  |  |  |
| --- | --- | --- | --- |
| Baseline characteristics and interventions | All parents (n=57,529) | Living with children | Not living with children (NWC, n=39,368) |
| (LWC, n=18,161) |
| aOR (95% CI) | aOR (95% CI) | aOR (95% CI) |
|  |  |  |  |
| *Socio-demographic* | |  |  |
| Parental status: | |  |  |
| LWC | 1 | n/a | n/a |
| NWC | 0.76 (0.70-0.82)\*\* | n/a | n/a |
| No. of children living with parent: | | |  |
| 1 | 1 | 1 | n/a |
| 2 | 1.04 (0.95-1.13) | 1.05 (0.97-1.13) | n/a |
| 3+ | 1.09 (1.00-1.20) | 0.95 (0.87-1.04) | n/a |
| Pregnancy status: | |  |  |
| Not pregnant | 1 | 1 | 2 |
| Pregnant | 1.21 (1.02-1.44)\* | 0.96 (0.73-1.26) | 1.42 (1.14-1.78)\*\* |
| Age: |  |  |  |
| 18-24 | 1 | 1 | 1 |
| 25-34 | 0.93 (0.84-1.03) | 0.90 (0.76-1.07) | 0.95 (0.84-1.08) |
| 35-44 | 0.98 (0.88-1.08) | 0.94 (0.79-1.12) | 1.01 (0.89-1.15) |
| 45+ | 1.20 (1.08-1.33)\*\* | 0.98 (0.81-1.18) | 1.33 (1.17-1.52)\*\* |
| Sex: |  |  |  |
| Male | 1 | 1 | 1 |
| Female | 1.11 (1.06-1.16)\*\* | 1.17 (1.09-1.26)\*\* | 1.06 (1.00-1.13)\* |
| Ethnicity: |  |  |  |
| White | 1 | 1 | 1 |
| BAME | 0.98 (0.91-1.05) | 1.06 (0.94-1.20) | 0.94 (0.85-1.03) |
| Employment status: | |  |  |
| NEET | 1 | 1 | 1 |
| Disabled | 0.92 (0.87-0.97)\*\* | 0.92 (0.83-1.01) | 0.92 (0.87-0.98)\*\* |
| EET | 1.33 (1.27-1.40)\*\* | 1.27 (1.17-1.37)\*\* | 1.39 (1.30-1.49)\*\* |
| Housing status: | |  |  |
| No housing problem | 1 | 1 | 1 |
| NFA | 0.65 (0.59-0.71)\*\* | 0.73 (0.52-1.01) | 0.65 (0.59-0.72)\*\* |
| Housing problem | 0.80 (0.75-0.85)\*\* | 0.84 (0.73-0.96)\* | 0.80 (0.74-0.86)\*\* |
| *Clinical* |  |  |  |
| Substance: | |  |  |
| Non-opiate user (OU) only | 1 | 1 | 1 |
| Alcohol and non-OU | 0.84 (0.79-0.90)\*\* | 0.95 (0.85-1.07) | 0.78 (0.71-0.85)\*\* |
| OU | 0.24 (0.22-0.26)\*\* | 0.29 (0.25-0.34)\*\* | 0.21 (0.19-0.24)\*\* |
| Alcohol only | 1.04 (0.98-1.11) | 1.14 (1.04-1.26)\*\* | 0.98 (0.90-1.06) |
| Injecting status: | |  |  |
| Non-injector | 1 | 1 | 1 |
| Injector | 0.59 (0.52-0.66)\*\* | 0.56 (0.41-0.76)\*\* | 0.62 (0.54-0.70)\*\* |
| Co-morbidity: | |  |  |
| No mental health problem | 1 | 1 | 1 |
| Mental health problem | 0.92 (0.88-0.97)\*\* | 0.93 (0.87-1.00)\* | 0.93 (0.88-0.98)\*\* |
|  |  |  |  |
| *Treatment exposure* |
| Referral source: | |  |  |
| Non-criminal justice referral | 1 | 1 | 1 |
| Criminal justice referral | 0.81 (0.76-0.87)\*\* | 0.88 (0.75-1.02) | 0.81 (0.76-0.88)\*\* |
| Days in treatment: | |  |  |
| <3m | 1 | 1 | 1 |
| 3-6m | 1.42 (1.35-1.49)\*\* | 1.35 (1.24-1.46)\*\* | 1.47 (1.38-1.56)\*\* |
| 6-12m | 1.45 (1.37-1.53)\*\* | 1.30 (1.18-1.42)\*\* | 1.54 (1.43-1.65)\*\* |
| 12m+ | 0.66 (0.62-0.71)\*\* | 0.57 (0.51-0.64)\*\* | 0.71 (0.65-0.77)\*\* |
| Previous treatment: | |  |  |
| 0 | 1 | 1 | 1 |
| 1 | 0.47 (0.44-0.49)\*\* | 0.48 (0.43-0.52)\*\* | 0.46 (0.43-0.49)\*\* |
| 2+ | 0.25 (0.22-0.28)\*\* | 0.26 (0.20-0.33)\*\* | 0.24 (0.21-0.28)\*\* |
| *Interventions* | |  |  |
| Outpatient pharmacological | 0.77 (0.72-0.82)\*\* | 0.80 (0.72-0.89)\*\* | 0.76 (0.70-0.82)\*\* |
| Outpatient psychosocial | 1.23 (1.08-1.41)\*\* | 1.12 (0.89-1.41) | 1.30 (1.11-1.52)\*\* |
| Inpatient detoxification | 1.13 (1.01-1.26)\* | 1.14 (0.93-1.40) | 1.13 (0.99-1.29) |
| Residential rehabilitation | 2.95 (2.57-3.39)\*\* | 2.05 (1.59-2.65)\*\* | 3.46 (2.94-4.09)\*\* |
| Recovery support: | |  |  |
| Parenting/ family support | 1.54 (1.41-1.67)\*\* | 1.58 (1.39-1.79)\*\* | 1.48 (1.33-1.66)\*\* |
| Housing/ employment | 1.37 (1.26-1.49)\*\* | 1.44 (1.22-1.70)\*\* | 1.36 (1.23-1.50)\*\* |
| Domestic abuse | 0.98 (0.81-1.19) | 1.06 (0.76-1.46) | 0.96 (0.75-1.21) |
| Child welfare support: | | |  |
| No support | |  |  |
| Early help | 1.06 (0.94-1.19) | 0.90 (0.79-1.04) | 1.40 (1.14-1.73)\*\* |
| Child in need | 1.21 (1.09-1.35)\*\* | 1.18 (1.03-1.36)\* | 1.22 (1.02-1.46)\* |
| Child protection | 1.17 (1.08-1.27)\*\* | 1.08 (0.97-1.21) | 1.25 (1.11-1.39)\*\* |
| Child looked after | 0.87 (0.78-0.96)\*\* | 0.95 (0.70-1.29) | 0.89 (0.79-0.99)\* |
|  |  |  |  |

# Study 2: Do targeted prevention interventions for families improve alcohol and drug treatment completions among parents with a substance use disorder? A quasi-experimental study using Generalized Boosted Models.

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## Abstract

**Background and aims** Treatment, targeted prevention in the form of parenting and/or family recovery support and ‘early help’, and statutory child welfare delivered by children’s social care are typical intervention options available to families affected by parental substance use disorder (SUD) in England. This study examines whether integration of targeted prevention with treatment would promote more successful completions than treatment only. **Design** Quasi-experimental:propensity scores were calculated then weighted via Generalised Boosted Modelling to estimate average treatment effects (ATEs). E-values were estimated to test the robustness of significant findings. **Setting** We used an English national administrative dataset for 1 April 2017 to 31 January 2020 (n=57,529). **Participants** We identified twelve subgroups: parents living with children (LWC) and parents not living with children (NWC) in treatment, stratified by sex and SUD (opiate user [OU], non-OU and alcohol only). **Interventions** Treatment only (Trt) was compared with two strategies: 1) Trt + parenting and/or family recovery support 2) Trt + ‘early help’. **Measure** Successful completion of treatment. **Findings** Few people received strategy 1. Compared with Trt, strategy 1 was found to have the strongest positive ATEs in 9 of the 12 subgroups, with e-values ranging from 1.83-2.48. Findings on the effectiveness of strategy 2 were mostly nonsignificant. **Conclusion** Integrated treatment and parenting and/or family recovery support is not received by many parents in the English treatment system, but it could be more effective than treatment only, including for parents not living with their children. However, results should be considered with some caution; while our approach generated a reasonably balanced comparison framework, there remains the possibility of other non-observed confounders or biases.

**Key words:** Parents, substance use, child welfare, treatment, generalized boosted model, quasi-experiment

## Introduction

Substance use disorder (SUD) among parents and carers requires intervention because it is associated with poor parent-infant relationships (Canfield et al., 2017; Pajulo et al., 2006; Slesnick et al., 2014), which can lead to child abuse and neglect (Hindley et al., 2006; Moreland et al., 2021; Rossow et al., 2016; Stith et al., 2009), and poor child outcomes (Bellis, Hughes, Leckenby, Baban, et al., 2014; Velleman & Templeton, 2007; Velleman & Templeton, 2016). However, there remains no international consensus on the best way to support families affected by SUD (McGovern et al., 2017).

Specialist treatment for SUD (hereafter ‘treatment’) includes both pharmacological and psychosocial interventions (NICE, 2011, 2012a) in outpatient and residential/ inpatient settings. Alongside specialist treatment, parents should be able to access a wide range of targeted prevention from within the treatment system to enhance their recovery capital, from support with housing and employment to activities specific to improving parenting skills and familial relationships (known as ‘parenting and/or family recovery support’). Another form of targeted prevention is ‘early help’ provided by children and family services (viz. children’s centres or Family Hubs) which are a level above universal access to ‘early help’ and below the threshold of statutory child welfare interventions such as child protection (Children's Commissioner, 2024).

While treatment in England has been shown to be effective in reducing substance use and related problems (Eastwood et al., 2018; Eastwood et al., 2017; Marsden et al., 2009; Marsden et al., 2012; Peacock et al., 2018; Willey et al., 2016), little attention has been paid to the different support needs of parents with SUD and their families. One previous analysis of the English National Drug Treatment Monitoring System (NDTMS) dataset suggested that parents who did not live with their children were more socioeconomically disadvantaged than those who did and were less likely to successfully complete treatment (Meier et al., 2004).

Reviews of the international literature suggest that programmes aimed at improving parenting and family functioning may be effective in reducing substance use when coupled with SUD treatment, however, more evidence is required to have confidence in findings (El-Banna et al., 2021; McGovern et al., 2021; Murphy et al., 2017). Most studies on the effectiveness of interventions for parents are from the US where drug consumption, treatment and child welfare systems are notably different from England (Forrester & Harwin, 2006; Gifford et al., 2014; McGovern et al., 2021). The parental outcomes reported often focus on successful treatment completion or reduction in substance use for mothers only. For children, commonly used outcomes are familial reunification or permanency, which is only relevant to children removed from their primary caregiver because of high safeguarding risks i.e. families with the most complex support needs receiving the most extreme child welfare strategy. Most children of parents receiving treatment in England do not fall into this category (Musto Wright et al., 2024a).

The literature also shows that fathers tend to be excluded from interventions (Maxwell et al., 2012; McGovern et al., 2023; Perez-Vaisvidovsky et al., 2023; Stover et al., 2018; Whittaker et al., 2022), despite most people receiving treatment for SUD being male, and paternal SUD being associated with poor child outcomes (Maxwell et al., 2012; McGovern et al., 2023). Evidence suggests that some fathers may welcome and benefit from intervention, even though engagement with services can be challenging (Maxwell et al., 2012; Rubenstein & Stover, 2016; Stover, 2015; Stover et al., 2019a). A UK feasibility study for the Parents Under Pressure parenting programme for opioid using fathers (PUP4Dads) has also reported promising outcomes in terms of SUD reduction and father-child relationships (Whittaker et al., 2022).

Previous work by our research team analysed the National Drug [and alcohol] Treatment Monitoring System (NDTMS) to explore characteristics of parents with SUD receiving specialist treatment and interventions aimed at promoting or safeguarding child welfare in England (Musto Wright et al., 2024a). This showed that parenting and/or family recovery support alongside treatment was associated with successful treatment completion for fathers and mothers irrespective of child living arrangements. Results on the association between early help and treatment were mostly mixed. This previous work was exploratory and did not adjust for potential confounding in a systematic way. To mitigate confounding by selection bias, this study used a quasi-experimental approach to test whether parents were more likely to complete treatment successfully if they received treatment plus targeted prevention in the form of parenting and/or family and early help.

## Methods

### Study design and setting

We used data from the NDTMS, an administrative dataset which records clinical and socio-demographic data on people receiving treatment for SUD in England, as well as patient outcomes. Data was captured at the start of the treatment process and reviewed throughout by keyworkers in clinical interviews with parents. As children’s social care data collection began 1 April 2017, data from this point was analysed up to 31 January 2020. We tested our hypotheses by using a quasi-experimental approach to estimate propensity score weights so that control and multiple intervention groups could be compared while minimising selection bias (see below for more detail).

### Population

As Figure 4.3‑1 shows, twelve population subgroups were created as they reflect important sex, family and substance use stratifications. They were also consistent with national reporting of NDTMS data and national strategies, and therefore familiar to English practitioners and policymakers. Our ‘parent’ sample were parents living with children (LWC) and parents not living with their children (NWC).

*Figure 4.3‑1 Subgroupings used in the analysis (n=48,169)*

### Interventions and outcome

As we were concerned with interventions delivered alongside treatment that may enhance outcomes further, the following interventions were compared with ‘Treatment only’ (Trt):

1. Trt + parenting and/or family recovery support offered by treatment services
2. Trt + ‘early help’ offered by children and family services

These strategies reflect status as recorded at the start of a parent’s treatment journey.

The outcome measure taken from the NDTMS was ‘successful completion of treatment’. This is defined as people who achieved all their care plan goals and were neither no longer dependent on the substances that brought them into treatment (as determined by a clinician) nor receiving pharmacological treatment (PHE, 2019a).

### Statistical analysis

The analysis was conducted using the Toolkit for Weighting and Analysis of Nonequivalent Groups (‘twang’) package in R (Cefalu, 2006) using the ‘mnps’ function adapted from Burgette et al. (2021).

We first created twelve datasets using the population groupings described earlier. A Generalized Boosted Model (GBM) was created for each of the twelve datasets to estimate the predicted probability, or propensity score, for a person in a subgroup to receive the intervention strategy they actually received given their characteristics (observed baseline covariates). Propensity scores were then weighted to adjust for confounders using GBM multiple regression trees which were built iteratively until the weighted distributions of the observed baseline covariates were similar between the control and intervention groups (known as ‘optimal balance’). The same observed baseline covariates used to estimate propensity scores were used to estimate weights (known as a ‘doubly robust’ approach), as recommended by Griffin et al. (2020) when samples sizes are large.

Two metrics of balance were used, the Adjusted Standardized Mean Differences (ASMD, or ‘effect size’) and Kolmogorov-Smirnov (KS) statistic. These were combined with two different methods for summarizing across observed baseline covariates (mean and maximum). These four methods were compared to determine the best stopping rule to use, i.e., when to stop the GBM iterative process to achieve optimal balance (Burgette et al., 2021; McCaffrey et al., 2013). We found 20,000 iterations using the mean KS achieved optimal balance. 57,529 parents were in treatment during the time frame, 48,169 of whom received treatment only or treatment plus targeted prevention. The remainder received a statutory child welfare intervention. The effective sample size (ESS), excluding those on a statutory child welfare intervention, after propensity score weighting was 47,047.

Our approach enabled a quasi-experimental evaluation of our intervention strategies compared with treatment only. We assumed that the sex of the parent, type of substance used and child living arrangements were important early factors when practitioners are deciding to which intervention parents would be initially assigned, and so we estimated the average treatment effects (ATEs) in each of the twelve subgroup models (Greifer & Stuart, 2021). As our outcome variable was binary (‘successful’ or ‘not successful’), the differences in ATE reflected percentage point differences for each intervention compared to treatment only.

#### Baseline covariates

While GBM can handle many baseline covariates, controlling for too many can adversely affect ATE and inflate the variability of weighted means (Griffin et al., 2017). We included only the most influential observed baseline covariates as determined by the significant baseline socio-demographic and clinical predictors of treatment completion from our previous exploratory analysis (Musto Wright et al., 2024a). The following seven variables were thus used: age; pregnancy among females aged 18-50; not in education, employment, or training (NEET); housing problem/ no fixed abode; concurrent mental health treatment need; criminal justice referral into treatment and multiple treatment episodes during the study period.

#### Missing data

Just over a fifth (22.7%) of our data were missing. Coffman et al. (2020) showed that, where data on potential confounders is missing at random, then missing values should first be imputed before applying GBM. The authors found no difference in bias or standard errors between single and twenty multiple imputations. We tested this for our dataset by comparing the standard errors and p-values of our observed patient characteristics in twenty datasets that we had imputed in our exploratory analysis (Musto Wright et al., 2024a). In line with Coffman et al. (2020), differences were negligible and not statistically significant (see supplementary Table B ‑1 in Appendix B). We therefore used a single imputation method for the GBM. (Full details on data prior to imputation, as well as missingness tests, can be seen in (Musto Wright et al., 2024a).

#### Sensitivity analysis

We used E-values to assess the robustness of ATEs. In quasi-experimental studies, it is possible for unmeasured confounders (features which cause both treatment assignment *and* outcome) to be misinterpreted as treatment effects (Linden et al., 2020). Adjusting for all measured covariates in a study, the e-value is defined as the minimum strength of association there would have to be between an unmeasured confounder and treatment assignment, and between the unmeasured confounder and treatment outcome, to fully explain away the treatment effect estimate. Thus, for every statistically significant ATE estimate in our study, e-values were calculated to estimate the minimum strength of confounder associations required for the ATE to become nonsignificant, after adjusting for the observed baseline covariates. E-values are quantified on a risk ratio scale, with results close to 1 indicating little unmeasured confounding would be necessary. In social sciences research, an effect size greater than twofold is not common, and a variable that affects both treatment assignment and treatment outcomes by greater than twofold is even less so (Localio et al., 2017). E-values were calculated using the ‘EValue’ package in R (VanderWeele & Ding, 2017).

## Results

Table 4.4‑1 describes the observed characteristics of people in the treatment system. The data highlights some notable differences between mothers and fathers. For example, irrespective of substance used and child living arrangements, mothers consistently had a higher proportion of co-occurring mental health treatment needs. Mothers were also more likely than men to be not in employment, education or training (NEET), but less likely than men to have been referred into treatment via the criminal justice system. Table 4.4‑1 also suggests that parents not living with children (NWC) have more complex support needs than parents living with children (LWC). For example, among opiate users (OUs), 11.0% of mothers and 8% of fathers LWC had a housing problem compared with 39% of mothers and 37.7% of fathers NWC.

Table 4.4‑2 shows the results of our chosen balance metric, the Kolmogorov-Smirnov (KS) statistic. This was calculated using our method for summarizing across observed baseline covariates, the mean. Compared with the unadjusted, there was a decrease in the mean KS statistic in all subgroup covariates to <0.10 following weighting. There was also an increase in all p-values. Together, these suggest that balance was achieved in our twelve subgroup samples used for analysis (Burgette et al., 2021; McCaffrey et al., 2013).

Table 4.4‑3 also provides the core study findings. Intervention strategies with a statistically significant average treatment effect, statistically significantly higher odds ratio of success, and e-value above 1 are shown in green. Strategies with statistically significantly higher odds ratio of success but with an e-value of 1 are shown in amber.

We first discuss here strategy 1 (Trt + parenting and/or family recovery support) compared with treatment alone. Relatively few people in the treatment system receives strategy 1 (3%). Of those that did, most were LWC mothers (27%). A higher proportion of alcohol only using parents were on strategy 1 (46%) than other substance groups.

For two of the twelve subgroups examined there was no significant difference in successful completion rates (subgroup 4: OU mothers who were NWC, and subgroup 7: OU men who were LWC). For subgroup 1: mothers LWC and OUs, there was a statistically significant outcome, but the e-value indicated little unmeasured confounding would be necessary to render the result nonsignificant. For all nine of the remaining subgroups however, strategy 1 was estimated to be (statistically significantly) more effective than specialist treatment only, with e-values ranging from 1.83-2.48. As an example, subgroup 2 of Non-OU mothers who were LWC had the highest average treatment effect (0.16), with an estimated probability of successful completion of 77.5% for strategy 1 compared with 61.5% for treatment only.

*Table 4.4‑1 Observed proportions of people having each of the seven baseline covariates from the multiple imputed dataset (n=57,529)*

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Substance | Covariate | Parents living with children | | Parents not living with children | |
| Mothers | Fathers | Mothers | Fathers |
| n (%) | n (%) | n (%) | n (%) |
| OUs | Aged 18-24 | 52 (3.2) | 26 (1.3) | 139 (2.9) | 167 (1.4) |
| Pregnant | 76 (4.7) | - | 203 (4.2) | - |
| NEET | 1,258 (77.8) | 1,164 (60.3) | 4,629 (95.9) | 10,292 (88.2) |
| Housing problem | 178 (11.0) | 155 (8.0) | 1,883 (39.0) | 4,397 (37.7) |
| Mental health treatment need | 702 (43.4) | 559 (28.9) | 2,777 (57.5) | 5,261 (45.1) |
| Criminal justice referral | 92 (5.7) | 297 (15.4) | 1,182 (24.5) | 3,903 (33.4) |
| Multiple treatment journeys | 264 (16.3) | 411 (21.3) | 1,932 (40.0) | 4,322 (37.0) |
| Non-OUs | Aged 18-24 | 311 (12.2) | 224 (7.1) | 318 (14.0) | 704 (9.2) |
| Pregnant | 130 (5.1) | - | 187 (8.2) | - |
| NEET | 1,853 (73.0) | 1,282 (40.7) | 2,027 (89.2) | 5,176 (67.9) |
| Housing problem | 321 (12.6) | 278 (8.8) | 536 (23.6) | 1,882 (24.7) |
| Mental health treatment need | 1,356 (53.4) | 1,088 (34.6) | 1,469 (64.6) | 3,680 (48.3) |
| Criminal justice referral | 58 (2.3) | 271 (8.6) | 158 (7.0) | 1,355 (17.8) |
| Multiple treatment journeys | 399 (15.7) | 390 (12.4) | 556 (24.5) | 1,533 (20.1) |
| Alcohol only | Aged 18-24 | 84 (1.7) | 32 (0.8) | 83 (1.9) | 119 (1.4) |
| Pregnant | 65 (1.3) | - | 81 (1.9) | (0.0) |
| NEET | 2,799 (56.4) | 1,363 (34.4) | 3,423 (78.3) | 5,934 (69.0) |
| Housing problem | 300 (6.0) | 167 (4.2) | 544 (12.4) | 1,360 (15.8) |
| Mental health treatment need | 2,528 (50.9) | 1,408 (35.6) | 2,503 (57.2) | 3,994 (46.4) |
| Criminal justice referral | 106 (2.1) | 186 (4.7) | 217 (5.0) | 1,005 (11.7) |
| Multiple treatment journeys | 930 (18.7) | 691 (17.5) | 1,222 (27.9) | 2,117 (24.6) |

*Table 4.4‑2 Summary of pre- and post-propensity score weighted Kolmogorov-Smirnov statistics averaged across observed baseline covariates using the mean. Presented by sex, SUD and child living arrangements (n=48,169;ESS=47,047)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Covariate | Parents living with children | | | | Parents not living with children | | | |
| Mothers | | Men | | Mothers | | Men | |
| Unweighted KS mean  (p-value) | Weighted  KS mean  (p-value) | Unweighted KS mean  (p-value) | Weighted  KS mean  (p-value) | Unweighted KS mean  (p-value) | Weighted  KS mean  (p-value) | Unweighted KS mean  (p-value) | Weighted  KS mean  (p-value) |
| OUs | Aged 18-24 | 0.09 (0.94) | 0.01 (1.00) | 0.03 (1.00) | 0.01 (1.00) | 0.02 (1.00) | 0.00 (1.00) | 0.01 (1.00) | 0.01 (1.00) |
| Pregnant | 0.05 (0.95) | 0.01 (1.00) | - | - | 0.09 (0.01) | 0.00 (1.00) | - | - |
| NEET | 0.21 (0.00) | 0.04 (1.00) | 0.28 (0.00) | 0.02 (1.00) | 0.04 (0.45) | 0.01 (1.00) | 0.09 (0.06) | 0.01 (1.00) |
| Housing problem | 0.21 (0.08) | 0.02 (1.00) | 0.21 (0.18) | 0.04 (1.00) | 0.09 (0.02) | 0.02 (1.00) | 0.11 (0.00) | 0.00 (1.00) |
| Mental health treatment need | 0.08 (0.33) | 0.05 (0.99) | 0.22 (0.37) | 0.03 (1.00) | 0.09 (0.04) | 0.00 (1.00) | 0.09 (0.00) | 0.02 (1.00) |
| Criminal justice referral | 0.20 (0.15) | 0.01 (1.00) | 0.09 (0.90) | 0.10 (1.00) | 0.10 (0.05) | 0.01 (1.00) | 0.22 (0.00) | 0.01 (1.00) |
| Multiple treatment journeys | 0.12 (0.16) | 0.07 (1.00) | 0.34 (0.03) | 0.05 (1.00) | 0.16 (0.00) | 0.03 (1.00) | 0.18 (0.00) | 0.01 (1.00) |
| Non-OUs | Aged 18-24 | 0.10 (0.00) | 0.01 (1.00) | 0.11 (0.07) | 0.02 (1.00) | 0.11 (0.00) | 0.02 (1.00) | 0.12 (0.00) | 0.01 (1.00) |
| Pregnant | 0.04 (0.71) | 0.00 (1.00) | - | - | 0.13 (0.01) | 0.01 (1.00) | - | - |
| NEET | 0.25 (0.00) | 0.04 (1.00) | 0.38 (0.00) | 0.07 (1.00) | 0.06 (0.57) | 0.02 (1.00) | 0.12 (0.00) | 0.01 (1.00) |
| Housing problem | 0.12 (0.02) | 0.02 (1.00) | 0.12 (0.01) | 0.06 (1.00) | 0.13 (0.01) | 0.02 (1.00) | 0.07 (0.02) | 0.01 (1.00) |
| Mental health treatment need | 0.12 (0.02) | 0.03 (1.00) | 0.22 (0.24) | 0.14 (0.93) | 0.11 (0.12) | 0.00 (1.00) | 0.07 (0.27) | 0.01 (1.00) |
| Criminal justice referral | 0.01 (1.00) | 0.00 (1.00) | 0.07 (0.50) | 0.07 (1.00) | 0.04 (0.99) | 0.02 (1.00) | 0.07 (0.23) | 0.02 (1.00) |
| Multiple treatment journeys | 0.13 (0.04) | 0.01 (1.00) | 0.04 (0.98) | 0.01 (1.00) | 0.09 (0.10) | 0.01 (1.00) | 0.03 (1.00) | 0.01 (1.00) |
| Alcohol only | Aged 18-24 | 0.05 (0.84) | 0.01 (1.00) | 0.03 (1.00) | 0.01 (1.00) | 0.05 (0.10) | 0.00 (1.00) | 0.06 (0.80) | 0.00 (1.00) |
| Pregnant | 0.01 (1.00) | 0.01 (1.00) | - | - | 0.04 (0.54) | 0.00 (1.00) | - | - |
| NEET | 0.27 (0.00) | 0.01 (1.00) | 0.22 (0.00) | 0.03 (1.00) | 0.19 (0.00) | 0.01 (1.00) | 0.20 (0.00) | 0.01 (1.00) |
| Housing problem | 0.04 (0.34) | 0.02 (1.00) | 0.05 (0.96) | 0.01 (1.00) | 0.09 (0.00) | 0.00 (1.00) | 0.14 (0.01) | 0.01 (1.00) |
| Mental health treatment need | 0.04 (0.21) | 0.01 (1.00) | 0.11 (0.06) | 0.01 (1.00) | 0.14 (0.00) | 0.01 (1.00) | 0.11 (0.35) | 0.01 (1.00) |
| Criminal justice referral | 0.03 (1.00) | 0.02 (1.00) | 0.02 (1.00) | 0.01 (1.00) | 0.05 (0.31) | 0.00 (1.00) | 0.10 (0.06) | 0.01 (1.00) |
| Multiple treatment journeys | 0.06 (0.18) | 0.01 (1.00) | 0.12 (0.53) | 0.09 (0.98) | 0.11 (0.02) | 0.01 (1.00) | 0.11 (0.16) | 0.01 (1.00) |

*Table 4.4‑3 Estimating probability of successful completion as the dependent variable to estimate average treatment effect (ATE) and odds ratios (ORs) (n=48,169;ESS=47,047)*

| Sex and child living arrangements | Substance | Sub-group | Strategy | N | Effective sample size (mean) | Estimated outcome (%) | ATE | OR (95% CI) | Sig | E-value  (CI limit) |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Mothers living with children | Opiate Users (OUs) | 1 | Treatment only (Trt) | 938 | 880 | 33.6% |  |  |  |  |
| Trt + parenting/family support | 128 | 106 | 42.2% | 0.086 | 1.58 (0.99-2.53) | p<0.05 | 1.00 |
| Trt + early help | 112 | 94 | 38.1% | 0.045 | 1.28 (0.78-2.13) | ns |  |
| Non-OUs | 2 | Trt | 1,132 | 1,038 | 61.5% |  |  |  |  |
| Trt + parenting/family support | 149 | 137 | 77.5% | 0.160 | 2.08 (1.39-3.13) | p=0.000 | 2.24 (1.64) |
| Trt + early help | 257 | 223 | 56.8% | -0.047 | 0.82 (0.61-1.11) | ns |  |
| Alcohol only | 3 | Trt | 3,165 | 3,052 | 65.5% |  |  |  |  |
| Trt + parenting/family support | 293 | 278 | 78.5% | 0.130 | 1.84 (1.39-2.43) | p=0.000 | 2.05 (1.63) |
| Trt + early help | 414 | 391 | 62.8% | -0.027 | 0.89 (0.72-1.11) | ns |  |
| Mothers not living with their children | OUs | 4 | Trt | 3,367 | 3,329 | 7.9% |  |  |  |  |
| Trt + parenting/family support | 196 | 151 | 10.1% | 0.022 | 1.31 (0.75-2.26) | ns |  |
| Trt + early help | 46 | 31 | 19.4% | 0.115 | 2.91 (1.34-6.29) | p<0.01 | 2.80 (1.58) |
| Non-OUs | 5 | Trt | 1,188 | 1,115 | 52.5% |  |  |  |  |
| Trt + parenting/family support | 95 | 70 | 73.3% | 0.207 | 2.41 (1.40-4.13) | p=0.000 | 2.48 (1.65) |
| Trt + early help | 64 | 49 | 49.0% | -0.035 | 0.87 (0.49-1.54) | ns |  |
| Alcohol only | 6 | Trt | 3,259 | 3,184 | 69.1% |  |  |  |  |
| Trt + parenting/family support | 242 | 225 | 82.5% | 0.134 | 1.79 (1.33-2.41) | p=0.000 | 2.01 (1.57) |
| Trt + early help | 84 | 70 | 72.5% | 0.034 | 1.16 (0.72-1.85) | ns |  |
| Fathers living with children | OUs | 7 | Trt | 1,546 | 1,537 | 22.5% |  |  |  |  |
| Trt + parenting/family support | 127 | 99 | 25.0% | 0.025 | 1.17 (0.72-1.90) | ns |  |
| Trt + early help | 63 | 55 | 17.5% | -0.050 | 0.68 (0.32-1.48) | ns |  |
| Non-OUs | 8 | Trt | 2,350 | 2,262 | 63.3% |  |  |  |  |
| Trt + parenting/family support | 141 | 135 | 67.4% | 0.041 | 1.60 (1.09-2.34) | p<0.01 | 1.84 (1.26) |
| Trt + early help | 135 | 102 | 68.1% | 0.048 | 1.06 (0.71-1.58) | ns |  |
| Alcohol only | 9 | Trt | 3,167 | 3,154 | 65.2% |  |  |  |  |
| Trt + parenting/family support | 195 | 182 | 75.9% | 0.106 | 1.89 (1.55-2.39) | p<0.001 | 2.09 (1.78) |
| Trt + early help | 163 | 150 | 63.3% | -0.020 | 1.64 (1.18-2.43) | ns |  |
| Fathers not living with their children | OUs | 10 | Trt | 10,036 | 10,029 | 17.6% |  |  |  |  |
| Trt + parenting/family support | 481 | 419 | 22.8% | 0.051 | 1.64 (1.26-2.12) | p<0.001 | 1.88 (1.50) |
| Trt + early help | 91 | 79 | 25.9% | 0.083 | 2.07 (1.17-3.68) | p<0.01 | 2.23 (1.38) |
| Non-OUs | 11 | Trt | 6,091 | 6,063 | 55.0% |  |  |  |  |
| Trt + parenting/family support | 279 | 254 | 66.9% | 0.119 | 1.64 (1.27-2.12) | p=0.000 | 1.88 (1.51) |
| Trt + early help | 157 | 148 | 59.4% | 0.044 | 1.20 (0.86-1.68) | ns |  |
| Alcohol only | 12 | Trt | 7,529 | 7,518 | 58.5% |  |  |  |  |
| Trt + parenting/family support | 391 | 360 | 69.3% | 0.108 | 1.58 (1.26-1.98) | p=0.000 | 1.83 (1.49) |
| Trt + early help | 98 | 78 | 64.9% | 0.064 | 1.31 (0.84-2.03) | ns |  |

*ATE= average treatment effect; OR= odds ratio; Sig=significance value; ns = nonsignificant. Legend: green= p-value <0.05, odds ratios > 1 and e-value >1, amber = p-value <0.05, odds ratios > 1 and e-value =1, red= p-value <0.05, odds ratios < 1 and e-value >1.*

Similar proportions received strategy 2 (Trt + early help) as strategy 1 (3%). Of those who did receive strategy 2, almost half were LWC mothers (47%). This was a higher proportion than observed for strategy 1. As with strategy 1, a higher proportion of alcohol only using parents were on strategy 2 (45%) than other substance groups. For ten of the subgroups results were non-significant. Significantly increases were found for subgroup 4: OU mothers who were NWC and subgroup 10: OU men who were NWC. The mothers in subgroup 4 were estimated to be almost three times more likely to successfully complete (OR=2.91, 95% CI: 1.34,6.29, p<0.01, E=2.80), while the men in subgroup 10 were estimated to be around two times more likely (OR=2.07, 95% CI: 1.17,3.68, p<0.01, E=2.23).

## Discussion

This is the first quasi-experimental study in England to estimate the effect of treatment plus targeted prevention for families on the treatment outcomes of parents. Our sample showed multiple vulnerabilities among both fathers and mothers living with children and mothers and fathers not living with children, however, on average, their health and social support needs were notably different. Using GBM to estimate the average treatment effects of different intervention strategies for different parent populations, we found that few parents were assigned to parenting and/or family recovery support and that this strategy seemed to be the most beneficial for the average non-opiate and alcohol using parent, including parents not living with their children. This finding was not replicated for opiate users, however. As the study included parents with a statutory child welfare intervention, our findings suggests that on average parents in treatment with a child in care or on a child in need/ child protection plan may also benefit if they received parenting and/or family recovery support.

In comparison, ATEs for treatment plus targeted prevention in the form of ‘early help’ was not significantly associated with higher successful completions than treatment only for most subgroups. The small number of people on this intervention may be affecting results. Also, while ‘early help’ can include parenting skills and improving familial relationships, it is not possible to know from the available data what ‘early help’ encompassed, and so the reasons for our ‘early help’ findings warrant further investigation.

Using ATEs for each subgroup we could estimate the causal effect of each treatment strategy for the average parent in that subgroup. Our e-value estimates ranging from 1.83-2.80 provide some confidence that unmeasured confounding would have to be substantial to overturn findings here. These ATEs can be applied to a future economic analysis on a treatment population wide policy, for example a cost-effectiveness analysis comparing treatment only with treatment plus parenting and/or family recovery support. Stratifying results, as we have done, by known patient characteristics, i.e. child living arrangements, sex and SUD type, can provide more useful information for clinicians and providers, as it better reflects how decisions on intervention strategies are made (Greifer & Stuart, 2021) and have been shown to achieve optimal balance in other propensity score analyses (Green & Stuart, 2014).

It is useful to compare our findings with previous literature. We were able to replicate findings of treatment alongside support to improve parenting skills and/or family functioning being more effective than treatment alone for most parents living with children (McGovern et al., 2022), as well as supporting the idea that family support networks potentially play an important role in a parent’s likelihood to recover from dependence (Best & Hennessy, 2022; Copello et al., 2005; Granfield & Cloud, 2001; McGovern et al., 2022). We did not stratify results by whether treatment was pharmacological, psychosocial or both. Potential differences in the balance of interventions received among opiate using parents in this study is a possible explanation for our findings for this group not corroborating those of previous research. Further investigatory research through access of local alcohol and drug treatment data could explore differences in support received by opiate using parents compared to other parents in the treatment system. Also, while we attempted to eliminate selection bias by including significant potential confounders to generate propensity weights (Shiba & Kawahara, 2021) and by stratifying our cohort, there are likely to still be unmeasured confounders which were not available in the data affecting estimates, such as parent motivation to abstain or the reason why a parent was not living with their children.

The use of successful completions as the outcome measure makes the study comparable to previous research on interventions for parents with SUD. However, given that SUD is a chronic health condition with potentially multiple cycles of treatment, abstinence, and relapse, it is not possible to determine whether recovery was sustained beyond the period of the study. While it is unclear precisely which parents not living with children would be more likely to successfully complete having received parenting support, it is unlikely to be an appropriate strategy in cases where a child is in foster care, for example, unless there is the possibility that the family will be reunited following comprehensive and intensive support. The intervention could also be advantageous for a father with regular child visiting arrangements whose child is living with a former partner or spouse, or with grandparents, for example. Further research into this area with a longer follow up would be useful to better understand the different reasons children are not living with their parents and the impact these differences may have on intervention assignment and outcomes. As this data is not recorded nationally, it would necessitate an analysis of case notes and outcomes data from alcohol and/or drug service and children’s social care or a local data matching exercise.

Given that there is no consensus on the best approach for addressing parental SUD, the findings in this study have important implications for policy and practice. Firstly, parenting and/or family recovery support interventions are not currently delivered enough in England, and even less so among fathers and/or parents not living with children, despite being strongly associated with positive treatment outcomes. The positive treatment effect could in part be explained by the fact that engagement with treatment services and/or recovery from SUD alone does not guarantee that families will become stronger and happier together. Many parents in the treatment system did not experience healthy, safe and loving relationships in their own childhood and so parenting may be a skill they have to learn. Moreover, after a period of substance use, family bonds and parent-child attachments may have broken down and so parents may require support in improving their relationships.

While this study is set in England, the literature has shown that many of the issues concerning maternal and paternal treatment completion and involvement in targeted prevention and statutory child welfare are similar to other countries. The generalisability and replicability of our study is further enhanced by our subgroup stratifications and outcome measure of successful completions, a common outcome measure among evaluations of treatment interventions for parents. We hope this paper brings to light the need for better data on outcomes for children whose parents are in treatment for SUD and the need for more parents, irrespective of whether they live with their children or not, to be offered integrated treatment and targeted prevention aimed at supporting parenting, children and families, where it is appropriate to do so.

## Conclusion

Treatment plus parenting and/or family recovery support is not received by many parents in the English treatment system. Fewer parents not living with their children were assigned to it than parents living with children, but it could be more effective than treatment alone for many mothers and fathers. However, results should be considered with some caution; while our approach generated a reasonably balanced comparison framework, there remains the possibility of other non-observed confounders or biases.

# Study 3: For parents with an alcohol use disorder, is treatment plus parenting and/or family recovery support a more cost-effective option than treatment only?

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## Abstract

**Background and aims** There is limited but growing evidence on parenting and/or recovery support interventions for alcohol use disorder (AUD), with the economic evidence being scarce. Previous studies have suggested that parenting and/or recovery support interventions plus treatment for AUD in England may be more effective than treatment alone. This study estimates its cost-effectiveness.

**Methods** A Markov model with 16 subgroups based on child living arrangements (parents living with and not living with their children), sex (women, men) and age group (18-24, 25-34, 35-44, 45+), was constructed to account for subgroup differences in health states (‘in treatment’, ‘in remission’, ‘not in treatment or remission’, dead). Model outputs, discounted over a 10-year time horizon and using probabilistic sensitivity analysis (PSA), show the incremental cost-effectiveness ratio (ICER) from a health perspective and the cost per QALYs using a public sector perspective.

**Results** Treatment plus parenting and/or recovery support was associated with an additional 0.0456 QALYs on average gained over a 10-year period, amounting to an ICER of £26,264 and a cost per QALY of £6,384. The probability the intervention is cost-effective at a willingness to pay threshold (WTP) of £20,000 is 42% using a health perspective and 72% for a public sector perspective, increasing to 53% and 73% respectively at a WTP of £30,000.

**Conclusion** Treatment plus parenting and/or family recovery support could be a more cost-effective option for parents. However, decision-makers should be cautious as further analyses highlighted substantial sensitivity and uncertainty in the economic modelling.

## Introduction

Globally, alcohol consumption is a leading risk factor for disease burden, with increased risk of mortality associated with higher levels of use (Griswold et al., 2018), and problematic use imposing a substantial social and economic burden (Laramée et al., 2013; Manthey et al., 2021). Alcohol use disorder (AUD) among parents and carers is associated with poor outcomes not just for the individuals, but also their partners (Shorter et al., 2023) and their children (Hughes et al., 2017). Adverse outcomes for children can continue through to adulthood, including children themselves developing future problems with alcohol (Anda et al., 2002). Families are more likely to be involved with child welfare services and family courts (Harwin et al., 2018) and children are more likely to have behavioural problems (Huq et al., 2021) thereby requiring more support from schools.

In England, between 2019 and 2020, around 121,000 parents/ carers were estimated to have an AUD, or 2.7 per 1,000 population. Around 223,000 children were estimated to be living with an adult with an AUD (OHID and The University of Manchester, 2024). Children of women who drank alcohol throughout their pregnancy may be born with foetal alcohol spectrum disorder (FASD) – an umbrella term used to describe a wide range of lifelong health conditions and disabilities – which has an estimated annual cost of over £2 billion in the UK (Schölin et al., 2021). Estimates suggest that parental alcohol use experienced in childhood is associated with annual costs of £17 billion respectively in adulthood from lost productivity (due to premature death or morbidity) in England (Hughes et al., 2020).

In their Cochrane systematic review and meta-analysis, McGovern et al. (2022) found moderate-quality evidence that treatment, in the form of psychosocial interventions tailored to parents, were more effective at reducing the frequency of alcohol (and drug) use among parents at 6 and 12 month follow-ups than usual care or other comparison conditions. Psychosocial treatment plus parenting and/or family functioning were more effective at reducing the frequency of parental alcohol (or drug) use compared with interventions that either targeted just alcohol (or drug) use or just parenting. However, the evidence to support this was rated very low to low by the authors.

Previous work by the research team (Musto Wright et al., 2024b) used a quasi-experimental approach to estimate the effectiveness of treatment for substance use disorder plus targeted prevention and statutory child welfare interventions compared with treatment alone in England. We found that compared with treatment only, integrated treatment with parenting and/or family recovery support is not received by many parents in the English treatment system, but this intervention strategy was associated with strongly significant higher average treatment effects (in terms of probability of successful completion of treatment) for all non-opiate and/or alcohol using parent subgroups irrespective of sex and child living arrangements, as well as one opiate using subgroup.

One study – the UK alcohol treatment trial (UKATT) - has analysed the cost-effectiveness of specialist treatment for AUD, comparing social behaviour network therapy plus usual treatment (including pharmacological interventions) compared with motivational enhancement therapy plus usual treatment (UKATT Research Team, 2005a). Most effectiveness and cost-effectiveness studies on parenting programmes for children in the UK are generally aimed at preventing conduct disorder in children (Bonin et al., 2011; Dretzke et al., 2009; Edwards et al., 2016; Stevens, 2014). More recently, a trial feasibility study explored the cost-effectiveness of the Helping Families Programme-Modified for parents with personality disorders, whose children have emotional and behavioural problems (Day et al., 2020).

Little is known about the cost-effectiveness of interventions aimed at improving parenting skills and family relationships for parents with a substance use disorder, including alcohol. Two UK trials have evaluated interventions aimed at reducing the risk of child maltreatment/ removal into care: the Parents under Pressure (PuP) programme (Barlow et al., 2019) and the Intensive Family Preservation Service (a.k.a. ‘Option 2’) in Wales (Forrester et al., 2008; Forrester et al., 2014). Both studies indicated that parenting programmes for high-risk families affected by parental substance use disorder could be cost-effective. In both studies most parents were mothers living with children. In the PuP programme, children were mostly <1 years old whereas the age range was broader in Option 2. Most PuP study participants reported to not use alcohol in the last 30 days (71%), whereas 59% of the Option 2 participants reported alcohol problems. PuP reported QALY gains from the intervention, whereas Option 2 did not.

This study builds on our previous work by estimating the cost-effectiveness of treatment and parenting and/or family recovery support interventions for parents with an AUD.

## Methods

### Population and setting

The population is adults aged 18+ who are in specialist treatment for AUD and who are either (a) adults living with children or (b) parents not living with their children.

We used data from the English National Drug [and alcohol] Treatment Monitoring System (NDTMS), an administrative dataset which records clinical, socio-demographic and outcomes data on people receiving treatment for alcohol and/or drugs. Data was recorded at the start of the treatment process and reviewed throughout by keyworkers in clinical interviews with parents. Data from 1 April 2017 to 31 January 2020 was analysed. The study sample were (a) parents living with children (LWC, n=6,332) and (b) parents not living with their children (NWC, n=10,788) in treatment for AUD.

We analysed parents who were recorded as receiving treatment only taken from previous work by our research team (Musto Wright et al., 2024b). Parents with AUD who received treatment only made up 78.2% (n=17,120) of the total parents with AUD in the treatment population. The remainder who were excluded from this study were those who received early help or a statutory child welfare intervention, such as having a child placed into care.

As shown in Figure 5.3‑1, in addition to segmenting the data by child living arrangements, data were further subcategorised by sex (‘women’ and ‘men’) and age groups (’18-24’, ‘25-34’, ‘35-44’, ‘45+’).

*Figure 5.3‑1 Stratification of study sample from National Drug Treatment Monitoring System over 34 months (1 April 2017 to 31 January 2020) into 16 subgroups by living arrangements/age/sex (n=17,120)*

### Comparators and treatment effect

Two treatment strategies were compared: specialist alcohol treatment only (the counterfactual) and treatment plus parenting and/or family recovery support i.e. treatment plus parenting and/or recovery support delivered alongside (and sometimes beyond) specialist alcohol treatment. The outcome measure was successful completion of treatment, referred to as ‘In remission’ in this study. A person is defined in the NDTMS as having successful completion of treatment if the person has achieved all their care plan goals and was clinically assessed as no longer dependent on the substances that brought them into treatment and they are not receiving pharmacological treatment. This definition is in line with official English reporting of treatment outcomes (PHE, 2019a).

### Deterministic Markov model for each subgroup

We constructed a Markov model in Microsoft Excel (version 2402) for each of the 16 study sample subgroups and aggregated results to estimate overall cost-effectiveness. Markov models are multi-state transition models where a patient cohort (e.g. parents with AUD in our study) moves to different health states over time (such as in treatment, in remission, not in treatment or remission or death) according to which strategy they have received (counterfactual or intervention in our study) (Siebert et al., 2012). For our 16 subgroups, we estimated quality-adjusted life years (QALYs) associated with each state at a given time. A QALY is a health outcome measure made up of two components: quality of life ‘utility’ (scored from 0 to 1), and life expectancy.

### Transition probabilities for specialist alcohol treatment only

As Figure 5‑2 shows, everyone in our Markov model begins in treatment. By the end of the year, they can transition to one of four states:

1. ‘In treatment’ (State A, still in treatment one year later, or left treatment and then re-presented to treatment)
2. ‘In remission’ (State B, successfully completing and not re-presenting to treatment)
3. ‘Not in treatment and not in remission’ (State C)
4. Died (State D)

Those alive at the end of the cycle progress to the following year. The oval shapes represent the possible states from which patients can move in and out. Died is an absorbing state, i.e. a patient cannot leave once they have entered that state, and is represented as a rectangle. The arrows correspond to the transition probabilities.

*Figure 5.3‑2 State transition diagram of the Markov model*

Died

(State D)

The *msm* package for multi-state modelling in R (Jackson, 2011) produces estimated hazard rates and transition probabilities for a chosen cycle length for a model (in our case, annual). Using our NDTMS data extract we were able to estimate how long it took for everyone in treatment to transition from their first time in treatment to one of the four health states (A-D) above. However, using NDTMS data only, we could not estimate the transition probabilities (*tp*) from ‘In remission’ to ‘Not in treatment and not in remission’ (*tpB2C*) or vice versa (*tpC2B*) and from either ‘In remission’ or ‘Not in treatment and not in remission’ to ‘Death’ (*tpB2D* or tp*C2D*). The *msm* package was able to use our observed data and produce hazard rates and estimated transition probabilities for every year in our model for each of the state transitions shown in Figure 5.3‑2.

### Estimating transition probabilities for treatment plus parenting and/or family recovery support

Our previous quasi-experimental study used NDTMS data to explore the effectiveness of treatment only compared with treatment plus parenting and/or family recovery support (Musto Wright et al., 2024b). Briefly, the quasi-experimental study involved 4 models for NDTMS participants in alcohol treatment, splitting by sex and by child living arrangements (LWC/NWC). To compare the two interventions, propensity scores were calculated then weighted via Generalised Boosted Modelling with 20,000 iterations each to estimate average treatment effects (ATEs) derived from the proportion of successful completions of treatment. E-values were also estimated to test the robustness of significant findings.

*Table 5.3‑1 Average treatment effects from previous quasi-experimental study (Musto Wright et al., 2024b) used to generate relative risks of successful completion by living arrangements and sex (n=18,241)*

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Sex | Child living arrangements | Strategy | Estimated outcome (%) | ATE | OR  (95% CI) | RR |
|  |
| Women | LWC\* | Treatment ('Trt') only | 65.50% |  |  |  |  |
| Trt + parenting/family | 78.50% | 0.130 | 1.84 (1.39 -2.43) | 1.19 |  |
| NWC | Trt | 69.10% |  |  |  |  |
| Trt + parenting/family | 82.50% | 0.134 | 1.79 (1.33-2.41) | 1.16 |  |
| Men | LWC | Trt | 65.20% |  |  |  |  |
| Trt + parenting/family | 75.90% | 0.106 | 1.89 (1.55-2.39) | 1.20 |  |
| NWC | Trt | 58.50% |  |  |  |  |
| Trt + parenting/family | 69.30% | 0.108 | 1.58 (1.26-1.98) | 1.18 |  |

*\*LWC = parent living with children, NWC = parent not living with children*

Using the odds ratios derived from the ATE shown above in Table 5.3‑1, we estimated the relative risk (RR) of having a successful completion of treatment for the intervention group. The RR was used to adjust the transition probability from ‘In treatment’ to ‘In remission’ (*tpA2B)* upwards (*tpA2B*\* RR = *tpA2B\_2*). Using the absolute difference between the two (*tpA2B\_2* - *tpA2B)*,we correspondingly reduced the transition probability from ‘In treatment’ to ‘Not in treatment and not in remission’ (*tpA2C*) for the intervention group (*tpA2C\_2 = tpA2C \* (tpA2B\_2 - tpA2B*)). To account for fewer people transitioning from being ‘In remission’ to ‘Not in remission’ (*tpB2C*) as a result of the intervention, we applied the same calculations above to the ‘In remission’ cohort. The final full estimated transition probability matrix for each of the 16 subgroups (both treatment only and the intervention) is shown below in Table 5.3‑2. As age was not included in Musto Wright et al. (2024b), for this study we assumed that the relative treatment effect measured by ATE applied equally to each of our four age groups in our cost-effectiveness analysis. We applied these to the comparator Markov models to estimate the differential health state transition probabilities associated with an increased likelihood of successful completion among those in the treatment plus parenting and/or family recovery support interventions cohort.

### Utility scores

*Treatment as usual (treatment only)*

Barbosa et al. (2010) estimated EuroQol-5 Dimensions (EQ-5D) (The EuroQol Research, 2020) derived utility scores from the UKATT study. The utilities presented were 0.6597 for ‘hazardous’ drinkers, 0.6349 for ‘harmful’ drinkers, 0.7001 for ‘ex-hazardous’ drinkers and 0.6459 for ‘ex-harmful’ drinkers. We assumed that ‘harmful’ and ‘hazardous’ drinker utility scores could be applied to our ‘not in treatment and not in remission’ health state (State C). Of the trial participants, 26% were ‘hazardous’ drinkers at baseline and the remainder were ‘harmful’ drinkers (UKATT Research Team, 2005b) and used these proportions to estimate a weighted mean average utility score for ‘Not in treatment and not in remission’ (State C):

*(0.6597\*0.26+0.6349\*(1-0.26) = 0.6413)*

An equivalent calculation for those in the ‘in remission’ (State B) health state was calculated using ‘ex-hazardous’ and ‘ex-harmful’ utility scores:

*(0.7001\*0.26+0.6459\*(1-0.26) = 0.6600)*

We assumed the ‘in treatment’ (State A) utility score in our model to be an average of the two results above:

*((0.6413 + 0.6600) / 2 = 0.6507)*

According to the effectiveness study (UKATT Research Team, 2005b), trial participants were mostly men, aged 42 and single/ married but not living with a partner, and so the socio-demographics are not comparable to many in our cohort. Unfortunately, it was not possible to estimate different scores for women, different child living arrangements and for different age groups.

*Intervention (treatment plus parenting and/or family recovery support)*

In the PuP programme trial, EQ-5D-5L derived utility scores were calculated at baseline, at 6 months and at 12 months follow up. We assumed the difference for those who received the parenting programme between 6 months and baseline (*0.030*) could be applied to our ‘In treatment’ (State B) utility score calculation above to get an equivalent utility score for those receiving the intervention (*0.6413+0.0300=0.6743*). We assumed the differences between 12 months and baseline (0.0610) could be applied to our ‘In remission’ (State C) cohort using the same approach (*0.6413+0.0610=0.7023*). While the trial did include alcohol users, most people in the study were drug using mothers with an infant and so not directly comparable to our cohort. In the study, the control group who did not receive a parenting intervention had a utility gain from baseline to 12 months of 0.02, similar to the observed gain from the UKATT study (Barlow et al., 2019).

### Costs

All costs were inflated to 2020/21 prices.

The annual cost of treatment for AUD is estimated to be £1,300 using a combination of official treatment expenditure data reported by local authorities and NDTMS data to apportion annual spend on people with AUD specifically (Musto Wright, 2021).

Bonin et al. (2011) modelled the cost of parenting programmes from five studies. They estimated the (median) costs of delivering group-based programmes to be £952 per person and of £2,078 for individual-based ones (2008/09 prices). As most parenting programmes delivered in the community are group based, we assumed the group-based cost in our base case analysis, which we applied to everyone on the intervention.

Public sector cost savings were taken from UKATT (UKATT Research Team, 2005a) which compared differences in public sector resources used by trial participants 6 months before randomisation and 6 months before follow-up. Excluding treatment costs, cost savings amounted to £1486 (2000/01 prices) per person per full year. UKATT savings were mostly from reductions in criminal justice costs because of less offending by participants (51%), followed by National Health Service (NHS) costs from improved health (45%) and social care costs (4%). Given the profile of trial participants described earlier, we applied these savings to NWC parents. Our previous research study has shown that LWCs had less complex support needs than NWCs and were less likely to be referred into treatment via a criminal justice referral. We therefore felt it would not be appropriate to apply the crime savings from UKATT to LWCs in our model, and as such cost savings amounted to £382 per person (2000/01 prices). This is likely to be conservative. In the PuP programme described earlier, 17% of participants (who were mostly mothers living with babies) had a criminal record and this increased to 28% among alcohol users (Barlow et al., 2019).

### Perspective and thresholds

In England, the National Institute for Health and Care Excellence (NICE) use QALY gains and differences in costs to help decide whether new treatments should be provided by the National Health Service (NHS). Government departments compare costs with gains in QALYs and other potential benefits associated with an intervention, such as reductions in public sector costs, to assess whether health and social care policy options represent value for money to the public purse (HM Treasury, 2022). According to NICE, because public health is much broader than health alone, analyses of public health interventions, of which AUD treatment would be an example, require a more comprehensive approach and a subsequent change from the standard health perspective to a public sector one (NICE, 2012b).

Hence, we present cost-effectiveness results as incremental cost-effectiveness ratios (ICERs) using a health (incremental treatment costs divided by QALY gains) and public sector perspective (differences in treatment and public sector costs divided by QALY gains). From a health perspective, the National Institute for Health and Care Excellence (NICE) use a threshold of £20-30,000 for NHS approvals.

*Table 5.3‑2 Transition probability for each of the 16 subgroups (LWC = parents living with children, NWC = parents not living with children)*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Sex | Women | | | | | | | | Men | | | | | | | |
| Age ranges | 18-24 | | 25-34 | | 35-44 | | 45+ | | 18-24 | | 25-34 | | 35-44 | | 45+ | |
| Child living arrangement | LWC | NWC | LWC | NWC | LWC | NWC | LWC | NWC | LWC | NWC | LWC | NWC | LWC | NWC | LWC | NWC |
| *Transitions from state A (in treatment) for Treatment Only* | | | | | | | | | | | | | | | | |
| tpA2A | 0.055 | 0.092 | 0.119 | 0.163 | 0.159 | 0.152 | 0.134 | 0.160 | 0.015 | 0.058 | 0.102 | 0.139 | 0.127 | 0.168 | 0.121 | 0.156 |
| tpA2B | 0.663 | 0.496 | 0.617 | 0.470 | 0.569 | 0.576 | 0.598 | 0.549 | 0.611 | 0.481 | 0.539 | 0.440 | 0.589 | 0.446 | 0.601 | 0.505 |
| tpA2C | 0.261 | 0.379 | 0.256 | 0.357 | 0.261 | 0.259 | 0.256 | 0.261 | 0.373 | 0.460 | 0.352 | 0.409 | 0.275 | 0.359 | 0.256 | 0.299 |
| tpA2D | 0.021 | 0.033 | 0.008 | 0.010 | 0.012 | 0.013 | 0.012 | 0.029 | 0.002 | 0.001 | 0.008 | 0.012 | 0.009 | 0.027 | 0.022 | 0.040 |
| *Transitions from state A (in treatment) for Treatment plus parenting and/or family recovery support* | | | | | | | | | | | | | | | | |
| tpA2A\_2 | 0.055 | 0.092 | 0.119 | 0.163 | 0.159 | 0.152 | 0.134 | 0.160 | 0.015 | 0.058 | 0.102 | 0.139 | 0.127 | 0.168 | 0.121 | 0.156 |
| tpA2B\_2 | 0.787 | 0.575 | 0.732 | 0.545 | 0.675 | 0.667 | 0.710 | 0.636 | 0.731 | 0.568 | 0.644 | 0.520 | 0.704 | 0.526 | 0.719 | 0.596 |
| tpA2C\_2 | 0.137 | 0.300 | 0.140 | 0.282 | 0.155 | 0.168 | 0.144 | 0.175 | 0.253 | 0.374 | 0.246 | 0.329 | 0.160 | 0.279 | 0.139 | 0.208 |
| tpA2D\_3 | 0.021 | 0.033 | 0.008 | 0.010 | 0.012 | 0.013 | 0.012 | 0.029 | 0.002 | 0.001 | 0.008 | 0.012 | 0.009 | 0.027 | 0.022 | 0.040 |
| *Transitions from state B (in remission) Treatment only* | | | | | | | | | | | | | | | | |
| tpB2A | 0.054 | 0.092 | 0.119 | 0.162 | 0.159 | 0.153 | 0.134 | 0.160 | 0.012 | 0.058 | 0.102 | 0.139 | 0.127 | 0.167 | 0.121 | 0.155 |
| tpB2B | 0.672 | 0.497 | 0.618 | 0.477 | 0.569 | 0.575 | 0.600 | 0.552 | 0.767 | 0.481 | 0.539 | 0.441 | 0.589 | 0.448 | 0.601 | 0.509 |
| tpB2C | 0.255 | 0.378 | 0.255 | 0.352 | 0.261 | 0.259 | 0.255 | 0.260 | 0.219 | 0.460 | 0.351 | 0.408 | 0.275 | 0.358 | 0.256 | 0.297 |
| tpB2D | 0.019 | 0.033 | 0.008 | 0.010 | 0.011 | 0.014 | 0.012 | 0.028 | 0.001 | 0.001 | 0.008 | 0.011 | 0.009 | 0.026 | 0.021 | 0.038 |
| *Transitions from state B (in remission) Treatment plus parenting and/or family recovery support* | | | | | | | | | | | | | | | | |
| tpB2A\_2 | 0.054 | 0.092 | 0.119 | 0.162 | 0.159 | 0.153 | 0.134 | 0.160 | 0.012 | 0.058 | 0.102 | 0.139 | 0.127 | 0.167 | 0.121 | 0.155 |
| tpB2B\_2 | 0.797 | 0.576 | 0.734 | 0.552 | 0.676 | 0.665 | 0.712 | 0.639 | 0.918 | 0.568 | 0.644 | 0.520 | 0.705 | 0.529 | 0.719 | 0.601 |
| tpB2C\_2 | 0.129 | 0.300 | 0.139 | 0.277 | 0.155 | 0.168 | 0.143 | 0.173 | 0.069 | 0.374 | 0.246 | 0.329 | 0.159 | 0.278 | 0.138 | 0.205 |
| tpB2D\_2 | 0.019 | 0.033 | 0.008 | 0.010 | 0.011 | 0.014 | 0.012 | 0.028 | 0.001 | 0.001 | 0.008 | 0.011 | 0.009 | 0.026 | 0.021 | 0.038 |
| *Transitions from state C (not in treatment and not in remission) Treatment only* | | | | | | | | | | | | | | | | |
| tpC2A | 0.055 | 0.092 | 0.119 | 0.163 | 0.158 | 0.152 | 0.134 | 0.160 | 0.016 | 0.058 | 0.102 | 0.139 | 0.127 | 0.168 | 0.121 | 0.157 |
| tpC2B | 0.650 | 0.495 | 0.615 | 0.465 | 0.568 | 0.578 | 0.596 | 0.546 | 0.483 | 0.481 | 0.538 | 0.440 | 0.588 | 0.444 | 0.600 | 0.499 |
| tpC2C | 0.273 | 0.379 | 0.256 | 0.359 | 0.261 | 0.259 | 0.257 | 0.262 | 0.499 | 0.460 | 0.352 | 0.408 | 0.275 | 0.360 | 0.256 | 0.299 |
| tpC2D | 0.022 | 0.034 | 0.009 | 0.013 | 0.013 | 0.012 | 0.013 | 0.032 | 0.001 | 0.001 | 0.008 | 0.012 | 0.010 | 0.029 | 0.023 | 0.045 |
| *Transitions from state C (not in treatment and not in remission) plus parenting and/or family recovery support* | | | | | | | | | | | | | | | | |
| tpC2A\_2 | 0.055 | 0.092 | 0.119 | 0.163 | 0.158 | 0.152 | 0.134 | 0.160 | 0.016 | 0.058 | 0.102 | 0.139 | 0.127 | 0.168 | 0.121 | 0.157 |
| tpC2B\_2 | 0.650 | 0.495 | 0.615 | 0.465 | 0.568 | 0.578 | 0.596 | 0.546 | 0.483 | 0.481 | 0.538 | 0.440 | 0.588 | 0.444 | 0.600 | 0.499 |
| tpC2C\_2 | 0.273 | 0.379 | 0.256 | 0.359 | 0.261 | 0.259 | 0.257 | 0.262 | 0.499 | 0.460 | 0.352 | 0.408 | 0.275 | 0.360 | 0.256 | 0.299 |
| tpC2D\_2 | 0.022 | 0.034 | 0.009 | 0.013 | 0.013 | 0.012 | 0.013 | 0.032 | 0.001 | 0.001 | 0.008 | 0.012 | 0.010 | 0.029 | 0.023 | 0.045 |
| *Notes:* |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *tp = Transition probability* | | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *A = in treatment, B = in remission, C = not in treatment and not in remission, D = dead, '\_2' denotes transition probabilities for the intervention arm* | | | | | | | | | | | | | | | | |
| 2' represents 'to' | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| *E.g. tpA2A = transition probability of someone in treatment remaining in treatment by the end of the year for someone in treatment as usual* | | | | | | | | | | | | | | | | |
| *and tpA2A\_2 = transition probability of someone in treatment remaining in treatment by the end of the year for someone in the intervention arm* | | | | | | | | | | | | | | | | |
| *LWC = living with children, NWC = not living with children* | | | | | | |  |  |  |  |  |  |  |  |  |  |

### Time horizon and discounting

We modelled a 10-year time horizon divided into annual cycles, as studies have shown of those that relapse, they typically do so within the first few years, with the likelihood reducing over time (Dawson et al., 2007; Mertens et al., 2012; Tuithof et al., 2014). As specialist treatment for AUD and parenting programmes are funded by local authorities in England and not by the NHS, we adopted the approach recommended by NICE to discount both costs and QALYs at 1.5% (NICE, 2012b).

### Deterministic sensitivity analysis

We conducted a deterministic sensitivity analysis to explore key structural assumptions under ten different scenarios. As before, all costs were uplifted to 2020/21 prices.

*Transition probabilities*

1. In this scenario we assumed that the increased transition probability from ‘In treatment’ to ‘In recovery following the intervention (*tpA2B\_2*) did not result in a corresponding reduction in the transition probability of ‘In remission’ to ‘Not in treatment or recovery’ (*tpB2C\_2*).

*Utility gains*

1. In Scenario 2, we assumed there were no utility score gains to be had from receiving the intervention. Thus, everyone irrespective of whether they received the intervention or not were assumed to have the utility scores derived from the UKATT study.
2. Here people on the intervention received the gains observed from the PuP study but instead of the gains lasting for one year, we assumed they would continue for two years.
3. As above, but lasting 10 years to fit with the model time horizon.
4. In this scenario,we used the individual-based cost of £2,078 (2008/09 prices) rather than the base-case cost of £952 (2008/09 prices) modelled by Bonin et al. (2011).
5. Here we used an intervention cost based on 80% group and 20% individual provision taken from expert opinion submitted to NICE and modelled by Bonin et al. (2011) (£1,177, 2008/09 prices), rather than the base-case cost £952 (2008/09 prices).
6. In the base case, we assumed that the cost savings observed at 6 month follow up in the UKATT trial would continue over a full year. Here, we analyse what would happen if the full year costs only applied to half a year, i.e. from £1486 (2000/01 prices) to £743 (2000/01 prices).
7. In scenario 6 we assumed that there were no crime savings for anyone ‘In treatment’ or ‘In remission’ (State B and C).
8. In the final scenario, in line with NICE guidance, we tested how the deterministic model results changed using a 3.5% discount for costs and QALYs rather than 1.5% (NICE, 2012b).

### Probabilistic sensitivity analysis

We conducted a probabilistic sensitivity analysis (PSA) to account for uncertainty in the parameters used in the base case deterministic Markov model. One thousand Monte Carlo simulations modelled the effects of adjusting parameters.

Dirichlet distributions were used to probabilistically estimate the transition probabilities into each health state (A-D) for each of the 16 subgroups. Dirichlet distributions are nested beta distributions, and in our study, parameters were equal to the number of people in each of the 16 subgroups. Transition probabilities were calculated from estimates of ‘successes’ and ‘fails’, i.e. the number who did not enter a health state, versus the number who did, accounting for the sample size. Dirichlet distributions satisfy the requirement that transition probabilities into multiple health states for a population must sum up to 1 (Bishai et al., 2023; Briggs et al., 2003).

Both the UKATT (Barbosa et al., 2010) and PuP trials (Barlow et al., 2019) reported standard errors as mean average utility scores. From this information we could use a *Method of Moments* technique (Bishai et al., 2023) to estimate the probabilistic parameters within a normal distribution.

Gamma distributions were used for probabilistic unit treatment and intervention cost estimates to account for cost data being highly skewed and for the requirement that costs less than £0 were not possible (Bishai et al., 2023). Specialist alcohol treatment costs were derived using NDTMS data on people and time spent in treatment (as well as LA expenditure reports), variance in person-days was used to estimate uncertainty in the PSA. Using this approach, we estimated the standard deviation to be 4.03% of our mean average and assumed this to be our probabilistic parameter. We assumed this applied to our intervention cost as Bonin et al. (2011) did not report enough information for us to make an estimate of variance.

Uncertainty surrounding public sector savings was estimated by applying the *Methods of Moments* approach to a normal distribution based on the data from the UKATT cost-effectiveness study (UKATT Research Team, 2005a).

## Results

As shown in Table 5.4‑1, results from the base-case deterministic Markov model suggested that, compared with treatment only, treatment plus parenting and/or recovery support was associated with an additional 0.0456 QALYs per person gained over a 10-year period. Incremental costs were £1,197 on average. From a health perspective, this amounted to an ICER of £26,264 which would be considered cost-effective using the NICE willingness to pay (WTP) threshold of £20-30,000.

Incremental public sector cost savings amounted to £906 per person. This resulted in a cost per QALY from a public sector perspective of £6,384 – four times more cost-effective than the health perspective.

*Table 5.4‑1 Per person deterministic Markov model results, modelled over 10 years*

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| # | Findings | Treatment only | Treatment plus parenting/ family support | Difference |
| 1 | Costs | £1,330 | £ 2,528 | £1,197 |
| 2 | Public sector savings | £8,252 | £9,159 | £ 906 |
| 3 | QALYs gained | 5.520 | 5.565 | 0.0456 |
| 4 | ICER (#1 / #3) (health) |  |  | £26,264 |
| 5 | Cost per QALY ([#1 - #2] / #3) (public sector) |  |  | £6,384 |

Table 5.4‑2 presents the results from the probabilistic sensitivity analysis, which were very close to the deterministic model. There were 0.0457 QALYs gained per person and an incremental cost of £1,193. This resulted in an ICER of £26,108. Public sector savings amounted to £918, resulting in a cost per QALY (public sector) of £6,023.

Figure 5.4‑1 shows the ICER and cost per QALY (public sector) results on the cost-effectiveness plane. The ICER and cost per QALY points at the right of the lower bound NICE willingness to pay threshold of £20,000 (diagonal threshold at 45°) would be considered cost-effective.

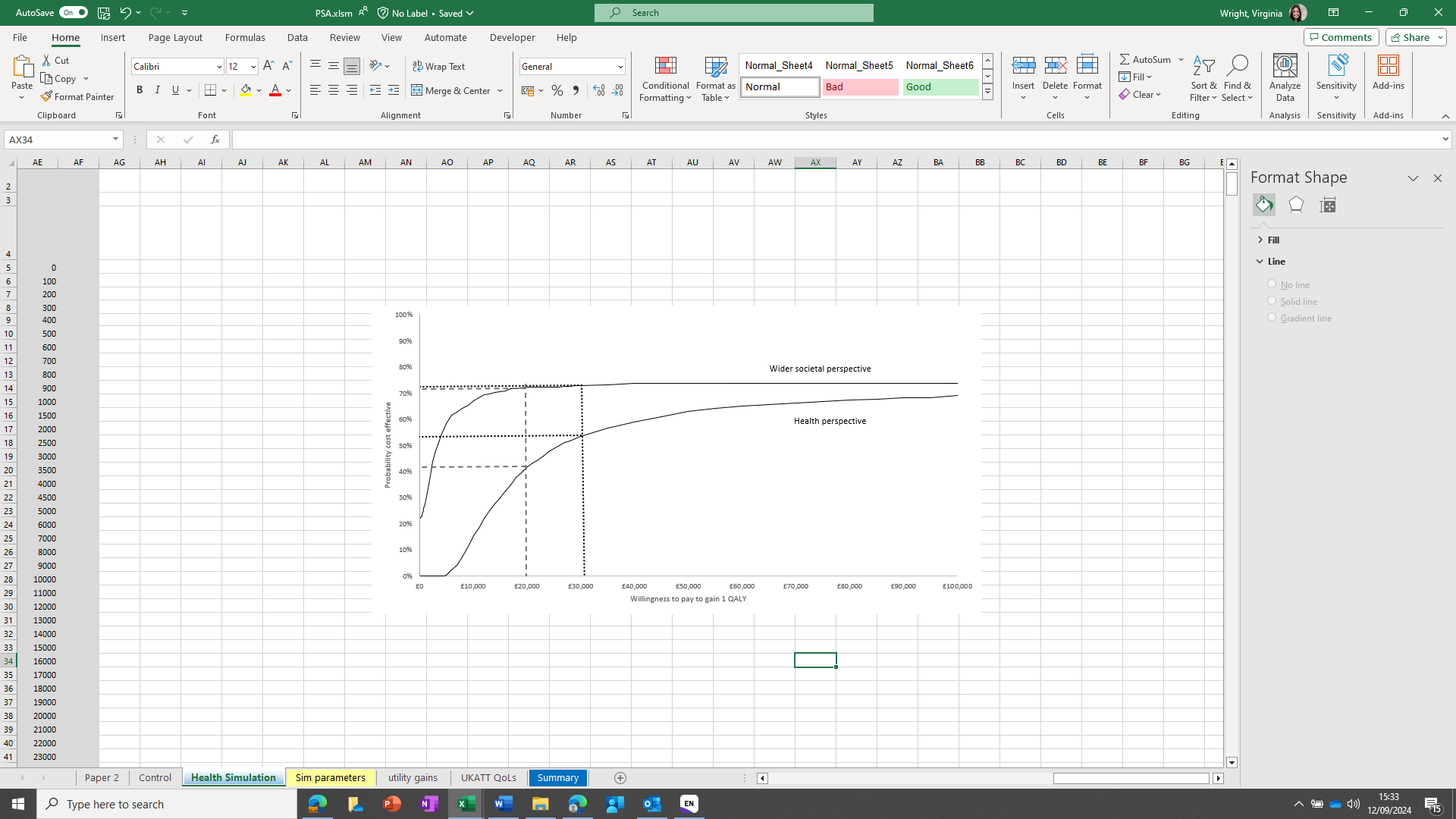
The scatterplot for the ICER shows incremental QALYs could range from 0.094 to 0.370, and incremental costs could range from £1,038 to £1,467. Most ICER scenarios were concentrated in the North East (more costly, more effective) and North West (more costly, less effective) quadrants. Overall, the probability of cost-effectiveness using a WTP of £20,000 is 42% rising to 53% for £30,000. Again, NICE would consider the intervention to be cost-effective in the borderline region.

*Table 5.4‑2 Per person cost-effectiveness results, by scenarios and modelling type*

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | Base case | Deterministic scenarios | | | | | | | | | Probabilistic |
| Transition probabilities | Utility gains | | | Costs | | | | Discounting |
| *1: No tpB2C changes* | *2: No intervention gains* | *3: Intervention gains for 2 years* | *4: Intervention gains over 10 year period* | *5: Individual sessions only* | *6: 80% group 20% individual sessions* | *7: 1/2 of UKATT crime savings* | *8: no UKATT crime savings* | *9: 3.5% discount* |
| Incremental  costs | £1,197 | £1,197 | £1,197 | £1,197 | £1,197 | £1,197 | £2,600 | £1,500 | £1,197 | £1,197 | £1,193 |
| Incremental public sector savings | £906 | £260 | £906 | £906 | £906 | £906 | £906 | £906 | £453 | £430 | £918 |
| Incremental  QALYs | 0.0456 | 0.0316 | 0.0162 | 0.0739 | 0.2719 | 0.0431 | 0.0456 | 0.0456 | 0.0456 | 0.0456 | 0.0457 |
| ICER | £26,264 | £37,969 | £73,885 | £16,210 | £4,403 | £27,762 | £56,978 | £32,872 | £26,237 | £26,237 | £26,108 |
| Cost per QALY (public sector) | £6,384 | £29,730 | £17,959 | £3,940 | £1,070 | £6,748 | £37,118 | £13,012 | £16,307 | £16,811 | £6,023 |

*Figure 5.4‑1 Cost-effectiveness planes with 1 QALY = £20,000*

*Figure 5.4‑2 Cost-effectiveness acceptability curves*



The scatterplot for the cost per QALY (public sector) show that incremental costs could range from -£323 to £559. The cost effectiveness acceptability curve indicates that compared with treatment only, the chance that treatment plus parenting and/or recovery support interventions is cost-effective at the lower bound WTP threshold of £20,000 is 72% rising to 73% if WTP is £30,000. Thus, there is more certainty of cost-effectiveness surrounding the results from the public sector perspective.

The results of the deterministic and probabilistic sensitivity analyses are also presented in Table 5.4‑1. The scenario results suggest that the model is highly sensitive to changes in the transition probabilities, utility gains and costs, but less so in changes to discount rates. From a public sector perspective, the intervention would be considered cost-effective under every scenario with the exception of scenario 6, where the cost of the intervention was assumed to be the cost of individualised rather than group sessions.

## Discussion

The evidence for parenting and/or family recovery support interventions is limited, especially for those receiving treatment for substance use disorders, such as AUD. This study presents, for the first-time, cost-effectiveness evidence supporting treatment plus parenting and/or recovery support interventions offered by AUD treatment services in England for both parents living with children and not living with children. Results from the deterministic and probabilistic Markov models suggest that, compared with treatment only, treatment plus parenting and/or family recovery support is cost-effective. Given that the intervention is a public health one, local authorities in England would be justified in commissioning AUD treatment plus parenting and recovery support. However, decision-makers should be cautious as further analyses highlighted some sensitivity and uncertainty in the economic modelling.

Our findings corroborate and build on previous studies that have suggested that treatment plus parenting programmes are an effective option for parents with AUD (Barlow et al., 2019; McGovern et al., 2022; Musto Wright et al., 2024a; Musto Wright et al., 2024b), as well as economic evaluations of parenting programmes aiming to improve child health, particularly in the context of internalising and externalising behaviours, mental health and child abuse (Barlow et al., 2019; Day et al., 2020; Forrester et al., 2014; Sampaio et al., 2024).

While we tried to be comprehensive in our approach to capturing costs and savings, there were some costs we were not able to include because of data limitations. For example, we were unable to model the reduction in occurrence or costs and increased benefits associated with reductions in FASD, or of reductions in children going into care. The use of ATEs based on successful completions of treatment is another limitation of the study as AUD is a chronic health condition which can involve multiple episodes remission and relapse. However successful completion is the main outcome measure in the English system and so we are using measures understood by English decision and policymakers. Moreover, through our health state transition probabilities over 10 years we have attempted to model rates of remission and relapse over time, and through our deterministic sensitivity analysis and PSA we adjusted for uncertainty in the transition probabilities. Our use of PSA also enabled us to adjust for uncertainty in our costs and utility scores.

Our assumption that the public sector savings costs from UKATT, which were published over twenty years ago, and which were derived from those receiving either motivational enhancement therapy or social behaviour and network therapy were comparable to our cohort is a further limitation. A research priority is to update and capture the broad spectrum of societal costs associated with parental AUD treatment for both children and parents. Using national administrative databases matched to NDTMS to measure reductions in, for example, hospital admissions (via the Hospital Episodes Statistics database) and offending (via the Police National Computer database) could be a more robust way of estimating public sector costs for parents with AUD in treatment as it does not rely on patient recall and the large sample sizes should lower the amount of variance in the observed data around the mean cost averages. Patients could also be followed up for longer than six months. As there is no social care database that could be matched to the NDTMS, resource usage would need to be captured via a longitudinal survey.

Similarly, a research priority would be to have QALYs more directly comparable to our cohort. In theory, this could be achieved by adding the EQ-5D-5L or similar to the NDTMS reporting and to ask for the survey to be completed once people enter treatment, during their reviews and at the end of treatment. In this way, the robustness of the QALY gains for all the different subgroups and health states in this study would be vastly improved.

While estimated QALY gains in parents are valuable outcomes, they are not relevant when regarding the wellbeing of their children (Barlow et al., 2019). Future research in this space should prioritise establishing a willingness to pay per child outcome gained, such as those measured using the BCAP (Ondersma et al., 2005), to be used in health economic evaluations, particularly as parental AUD is associated with poor parenting capacity, sensitivity and attachment (Canfield et al., 2017; Slesnick et al., 2014) – key factors in child safeguarding risk. Moreover, standard quality of life utility instruments used in health economic evaluations may not be appropriate for measuring meaningful change in health status for people with AUD (Payakachat et al., 2015). Thus, a key research priority would also be to develop a more suitable measure.

Our previous research (Musto Wright et al., 2024a; Musto Wright et al., 2024b) showed that relatively few parents or carers with a substance use disorder, including AUD, received treatment plus parenting and/or family recovery support, despite our analysis suggesting that this is a more effective option than treatment alone for most parents irrespective of child living arrangements. Given that we also find the intervention to be cost-effective in this study, we hope that there is more consideration into commissioning parenting and/or family recovery support interventions and more referrals into such interventions being made regardless of whether parents live with their children or not.

Over the past decade, English local authorities have reduced spend on targeted prevention activities for families, such as parenting programmes. As these services are non-statutory, they are vulnerable to being cut when budgets are constrained (Franklin et al., 2023). This study shows there may be benefits associated with commissioning parenting and/or family recovery support for parents with AUD and offering more parents the opportunity to engage with the intervention. Given the limited economic evidence on interventions for parents with AUD in England, we hope that the findings of this study represent a useful contribution to the field. We further hope the study offers a methodology that is generalisable in other countries and identifies key research priorities to reduce uncertainty in future estimates.

## Conclusion

The analysis suggests that compared with treatment only, treatment plus parenting and/or family recovery support could be a more cost-effective option for parents receiving treatment for AUD in England. However, decision-makers should be cautious as further analyses highlighted substantial sensitivity and uncertainty in the economic modelling.

# Discussion and conclusion

## Summary of key findings

This thesis explored the following research questions via three interconnected studies using a national observational dataset:

1. Do patient characteristics affect the types of interventions parents with substance use disorder (SUD) receive and/or their outcomes?
2. Is integrated treatment with child welfare support a more effective option than treatment alone for parents with SUD?
3. Is integrated treatment and child welfare support a more cost-effective option than treatment alone for parents with SUD?

The collective main findings (F) from the three studies are summarised below, along with a short reminder of the respective approaches taken.

Study 1 was an exploratory and descriptive analysis of the characteristics of parents in treatment, interventions received and successful completion from treatment. Multilevel multivariable logistic regressions were used to estimate associations, adjusting for baseline characteristics. Estimates of successful completion were derived using a multiple imputation model. E-values of the multiple imputation derived estimates were calculated as a sensitivity analysis, to test the magnitude of confounder associations that would be needed to render a significant finding non-significant. This study presented eight key findings.

**F1** Parents with SUD in treatment are not a homogenous group, with parents not living with their children being more likely to have multiple and complex support needs compared with non-parents and parents living with children.

**F2** Child living arrangements (parent living with or not living with children) are a more important predictor of multiple and complex support needs than sex.

**F3** Several variables were found to be associated with increased likelihood of receiving treatment plus an intervention that promotes or protects child welfare (parenting and/or recovery support, early help, child in need/ child protections plans). These were: living with children (rather than not living with children), being a mother (rather than a father), being aged 25 or older (rather than a young adult aged 18-24), having more than one child at home (rather than just one child at home). Injecting drug users were three time more likely to have a child in care than non-injectors.

**F4** Just 2% of treatment took place in residential care. Treatment in a residential care setting had a significant association with successful completion of treatment compared with no treatment in a residential setting, with likelihood greater for parents not living with children than parents living with children. The strength of association was larger than the association for outpatient treatment, or for inpatient detoxification.

**F5** Parents not living with children and having at least one of their children in care were less likely to complete treatment than those who did not have a child in care.

Study 2 was a quasi-experimental longitudinal study. Generalized Boosted Models (GBM) were used to estimate propensity scores and associated weights for assignment into multinomial interventions and evaluation of corresponding average treatment effects. The interventions were: treatment only and treatment plus targeted prevention in the form of 1) parenting and/or family recovery support and 2) early help. Average Treatment Effect (of successful completion of treatment) was the outcome measure. Again, e-values were calculated as a sensitivity analysis.

**F6** A minority of people in the treatment system receive treatment plus parenting and/or family recovery support or early help. Of those who do, most are mothers living with children and alcohol only using parents.

**F7** Treatment plus parenting and/or family recovery support could be a more effective option compared with treatment only for non-opiate and/or alcohol using parents regardless of sex and child living arrangements. Results on early help were mostly nonsignificant.

**F8** E-value estimates for each population subgroup ranged from 1.83-2.80, providing some confidence that unmeasured confounding would have to be substantial to overturn findings.

**F9** Treatment plus parenting and/or family recovery support for opiate using parents was found to be mostly nonsignificant or the sensitivity analysis suggested little unmeasured confounding would be necessary to render the results nonsignificant.

Study 3 was a cost-effectiveness analysis focusing on the population group with alcohol use disorder (AUD) only. It used data from the NDTMS and published literature to model 16 subgroups over a 10-year horizon, calculating costs of treatment, integrated care, probabilities of being in four health states in a Markov model (‘In treatment’, ‘In remission’, ‘Not being in treatment and not in remission’ and ‘Died’), and the resulting Quality Adjusted Life Years (QALYs). A comparison of difference scenarios in the deterministic model tested the sensitivity of key assumptions. A probabilistic sensitivity analysis was conducted to estimate model uncertainty.

Two perspectives were presented – a health only perspective, for which an incremental cost effectiveness ratio (ICER) was calculated and a public sector perspective, for which wider societal benefits were included in the model and the result summarised as a cost-per-QALY. Wider societal benefits included, for example, cost reductions from decreases in offending behaviour and visits to A&E.

**F10** Treatment plus parenting and/or family recovery support could be a more cost-effective option than treatment only for both parents living with children and parents not living with their children.

**F11** The modelled QALY difference per person in the deterministic model was 0.0456 and 0.0457 in the probabilistic model. The modelled cost difference in the deterministic model was £1,197 in the deterministic model and £1,193 in the probabilistic model.

**F12** The intervention was associated with an ICER of £26,264 in the deterministic model, and an ICER of £26,108 in the probabilistic model. Assuming a NICE willingness to pay threshold of £20-30,000, the intervention would be considered cost-effective.

**F13** In the deterministic model, the intervention was associated with cost per QALY of £6,437 (public sector) – four times more cost-effective than the health perspective in the deterministic model. Similar results were found in the probabilistic model (£6,023). The scenario results suggest that the model is highly sensitive to changes in the transition probabilities, utility gains and costs, but less so in changes to discount rates.

**F14** The probability that the intervention is cost-effective at a willingness to pay threshold of £20,000 is 42%, using a health perspective and 72% for a public sector perspective, highlighting some uncertainty in the economic modelling.

## Interpretation of findings and their implications

I hypothesised that the sex of the parent, whether or not they lived with their children, and the type of substances used would affect the type of intervention a parent would be assigned and their subsequent outcomes. In line with the hypotheses, **F1**, **F2** and **F3** from study 1 indicate that there were significant differences in relation to patient characteristics and treatment assignment with proportionately more mothers than fathers receiving some kind of integrated support. The likelihood increased for those who lived with children.

Studies in this area have suggested that mothers who are young, pregnant, have had children removed previously, homeless or in unstable housing, have comorbid mental health problems, unemployed, have had involvement with the criminal justice system, and/or living with more than one child are predictive characteristics of coming to the attention of services (Canfield et al., 2017). The findings from study 1 corroborated these results.

Research using NDTMS data suggested that parents who did not live with their children were both more socioeconomically disadvantaged and less likely to successfully complete treatment than parent who did live with their children (Meier et al., 2004; NTA, 2012). This thesis supports this finding and has expanded understanding by comparing parents not living with children not just with parents living with children, but also non-parents in the treatment system, to highlight that parents not living with children appear to have more multiple and complex support needs than others in the entire treatment system.

Previous research has typically focused on mothers living with children, or with children in, or at risk of being placed in, care. (McGovern et al., 2022; Moreland & McRae-Clark, 2018; Murphy et al., 2017; Neo et al., 2021). The fact that fewer men were assigned to any kind of additional support potentially reflects a possible failure of universal, targeted and specialist services to identify male carers with SUD and to support them as much as they do female carers to develop better parenting strategies (The Child Safeguarding Practice Review Panel, 2021).

The literature shows that fathers tend to be excluded from interventions (Maxwell et al., 2012; McGovern et al., 2023; Perez-Vaisvidovsky et al., 2023; Stover et al., 2018; Whittaker et al., 2022), despite most people receiving treatment for SUD being male, and paternal SUD being associated with poor child outcomes (Maxwell et al., 2012; McGovern et al., 2023). Studies have shown that some fathers may welcome and benefit from intervention, even though engagement with services can be challenging (Maxwell et al., 2012; Rubenstein & Stover, 2016; Stover, 2015; Stover et al., 2019a). A UK feasibility study for the Parents Under Pressure parenting programme for opioid using fathers (PUP4Dads) has also reported promising outcomes in terms of SUD reduction and father-child relationships (Whittaker et al., 2022).

The finding that treatment in a residential rehabilitation ‘rehab’ unit may provide parents with a better treatment outcome is of note (**F4**). Previous research on the effectiveness of residential and non-residential based interventions specifically for mothers of substance-exposed infants in care found that the most significant factor in family reunification was not the treatment type or setting but rather treatment retention, and that combined outpatient and residential treatments was the only variable significantly correlated with retention (Huang & Ryan, 2011). It is possible that our results support this, as treatment interventions were not mutually exclusive groups in the model. As rehabs require their patients to abstain from alcohol use and illicit substance use during their stay, it is typical for people on a residential treatment pathway in England to have received treatment in an outpatient setting before a stay in rehab to support their abstinence prior to entry, and/or after to sustain their abstinence. The fact that a minority of parents received treatment in a rehab may be explained by the lack of residential programmes for parents that can also accommodate their children or child visitations in England, as well as residential programmes being a more costly option than treatment in an outpatient setting.

It was perhaps not surprising that having a child in care was associated with a lower likelihood of successfully completing treatment (**F5**). Having a child placed into care increases trauma and the risk of substance use, depression and suicidal ideation (Alrouh et al., 2022; Broadhurst & Mason, 2020; Crawford et al., 2009; Darlington et al., 2023), thereby reducing a parent’s recovery capital substantially.

The above findings should be interpreted with caution, as they are taken from a study designed to be descriptive of characteristics, interventions and outcomes and as such are subject to confounding.

My quasi-experimental findings on the effectiveness of targeted prevention provided some novel insights. In recent years there have been several reviews on SUD, parenting interventions and parental and child outcomes (e.g. McGovern et al., 2023; Moreland & McRae-Clark, 2018; Peisch et al., 2018) which have suggested that treatment plus parenting interventions could be more effective than treatment only. Using the NDTMS, I was able to test whether these previous findings would be replicated among a much broader category of ‘parent’ (mothers and fathers both living and not living with their children).

A minority of people in the treatment system received the intervention (**F6**). It is not unusual for alcohol and drug service key workers to have casework numbers of 60 to 80 clients, making the individualised support that parents, often with multiple and complex support needs, impossible to deliver. Matters are further complicated by the fact that key workers in the current treatment system, as Dame Carol Black’s *Independent review of drugs* (Black, 2021) demonstrates, have low levels of training and will lack the therapeutic expertise to work effectively with these families.

However, as **F7** suggests, treatment plus parenting and/or family recovery support was associated with higher ATEs than treatment only. However, this was only consistently the case for non-opiate using parents and alcohol using parents. Therefore, the evidence would support treatment services assigning non-opiate and alcohol using parents to parenting and/or family recovery support interventions, particularly as the sensitivity analysis provided some confidence that unmeasured confounding would have to be substantial to overturn findings (**F8**).

The positive treatment effect associated with treatment plus parenting and/or family recovery support could in part be explained by the fact that engagement with treatment services and/or recovery from SUD alone does not guarantee that families will become stronger and happier together. Many parents in the treatment system did not experience healthy, safe and loving relationships in their own childhood and so parenting is a skill they may have to learn. Moreover, after a period of substance use, family bonds and parent-child attachments may have broken down and so parents may require support in improving their relationships.

While it is unclear precisely which parents not living with children would be more likely to successfully complete having received this strategy, it is unlikely to be an appropriate strategy in cases where a child is in care unless, for example, there is the possibility that the family will be reunited following comprehensive and intensive support. It could however be advantageous for a father with regular child visiting arrangements whose child is living with a former partner or spouse, or with grandparents, for example.

It is possible that our findings were inconclusive for opiate using parents assigned to treatment plus parenting and/or family recovery support (**F9**) because we did not stratify results by whether treatment was pharmacological, psychosocial or both. Potential differences in the balance of interventions could be affecting results for this subgroup. Another possible reason is an unmeasured confounder affecting results. For example, an indicator of a parent’s motivation to stop using heroin is not captured in NDTMS, however it’s a characteristic which could reasonably affect our findings.

Previous economic evaluations of parenting programmes aiming to improve child health, particularly in the context of internalising and externalising behaviours, mental health and child abuse have suggested that parenting programmes were cost-effective (Barlow et al., 2019; Bonin et al., 2011; Day et al., 2020; Edwards et al., 2016; Forrester et al., 2014; Sampaio et al., 2024). As **F10-13** highlight, this thesis has been able to corroborate this in the context of parents with AUD receiving parenting and/or family recovery support interventions compared with treatment only, with cost-effectiveness and model uncertainty vastly improving (**F14**) if a wider perspective than health is incorporated.

### Recommendations to policy and decision-makers based on the findings and implications of this thesis

In this section, I consider what my responses would be if decision makers were to ask me for some of the key recommendation that I would make on the basis of the PhD work I have done. The following are recommendations that I could argue follow from the thesis work.

Treatment services should recognise that parents not living with their children may have support needs which may be more complex than appears at first sight and tailor their interventions accordingly (**F1**,**F2**).

Treatment and children and family services should ensure they offer fathers the same interventions they would offer mothers, where relevant (**F3**,**F6**).

National government should prioritise funding to support the future commissioning of evidence-based interventions for vulnerable children and families in England, such as those affected by parental SUD. This includes parenting and/or family recovery support and treatment in a residential setting which can accommodate children or child visitations (**F4, F7, F10-14**).

Treatment services should recognise that opiate-using parents and/ or those with a child in care may require more support to complete treatment, especially those not living with their children, even if they are offered a parenting and/or family recovery support intervention. Treatment services should consider whether their service is able to provide comprehensive support, ensuring they have the necessary links with local children and family services, and other local partners to do so (**F5**, **F9**).

## Strengths of this thesis

The main strength of this thesis is the use of a national database which provided large sample sizes and long-term follow up of parents in the treatment system. In addition, the database has comprehensive coverage across the country. The vast data included in the database enabled the results to be adjusted for pertinent baseline characteristics and facilitated quasi-experimental and cost-effectiveness analyses. The use of the National Drug [and alcohol] Treatment Monitoring System (NDTMS) allowed me to analyse differences that were hitherto largely unexplored, such as differences between mothers and fathers and parents living with, and not living with, children.

Most studies in this area are from the US, thereby limiting generalisability of effectiveness and cost-effectiveness results in the wider English context. In particular, the American and English legal, child welfare and treatment systems are substantially different, with further notable differences in the types of drugs used by parents also apparent. In England*,* cases typically enter court at a later stage, residential treatment facilities are less frequently used, and the use of lower threshold services such as Alcoholics Anonymous and Narcotics Anonymous are not essential parts of a treatment care plan (Gifford et al., 2014). Thus, this study enables the research community and policy- and decision-makers to better understand the characteristics of parents with SUD in the English treatment system and the effectiveness and cost-effectiveness of interventions they receive in this country. Also, the methods used in this study are replicable for use with another administrative dataset from any jurisdiction.

Our subgroup analyses enabled for the first time in the literature, a comprehensive exploration and analysis of outcomes for mothers compared with fathers, living with and not living with children, using different substances. This is particularly significant given that proportionately far more fathers than mothers are in the treatment system and the paucity of evidence on interventions for fathers.

UK guidance for government analysts is to use the Maryland Scale of Scientific Methods (Sherman et al., 1998) when assessing the robustness of evaluation design (HM Treasury and Evaluation Task Force, 2011). The scale is from 1 (very low) to 5 (very high). The use of a quasi-experimental study to analyse effectiveness and cost-effectiveness would be 4 on the Maryland Scale (with 5 reserved for randomised control trials). Robustness was further enhanced by reporting not significance but also e-values larger than 1 to highlight the strength of associations between an unmeasured confounder, with our observed characteristics and our significant associations.

In England, the National Institute for Health and Care Excellence (NICE) use QALY gains and differences in costs to help decide whether new treatments should be provided by the National Health Service (NHS). Government departments compare costs with gains in QALYs and other potential benefits associated with an intervention, such as reductions in public sector costs, to assess whether health and social care policy options represent value for money to the public purse (HM Treasury, 2022). According to NICE, because public health can be much wider than health alone, analyses of public health interventions, of which treatment and treatment plus parenting and/or recovery support would be examples, require a more comprehensive approach and a subsequent change from the standard health perspective to a public sector one (NICE, 2012b). Thus, the presentation of not just ICERs (health perspective) as is standard in the cost-effectiveness literature, but also cost per QALYs (public sector perspective) reflect how commissioning decisions are made in England. The cost-effectiveness study was further strengthened through the use of analyses to estimate model uncertainty and the sensitivity of key assumption so that decision-makers have enough information to make informed commissioning decisions.

For someone who has spent most of their career in the public sector specialising in SUD, an important strength is also that the findings of this research have real world implications and I am able to provide policymakers and practitioners with recommendations on how best to support families in increasingly financially constrained times and most importantly of all make an actual difference to the lives of children and families affected by parental SUD.

## Limitations and recommendations for future research

‘Patients’ are identified in the NDTMS using attributable information, viz, first name initial, surname initial, sex, date of birth. Local authority of residence is also used to identify a unique patient. This means that any change in any of the identifiers for a person would create a new patient record and as such would be treated as if belonging to a different person. While such a method helps to protect people’s identity on a database which records extremely sensitive information, it could be problematic when analysis is done on, for example, people who are rough sleeping or have unstable housing and so may move around a lot or mothers who get married and change their surname. Issues also arise when a person is recorded by their official name in one treatment service and by their nickname in another. A solution to this problem would be to use a widely used administrative identifier such as NHS number (Eastwood, 2019). However, this limitation is greater for studies that require matching NDTMS with other datasets. For the studies included in this thesis, this limitation predominantly amounts to a risk of there being a small degree of double-counting which is unlikely to have materially affected the results.

While parental status should be asked and recorded on the NDTMS, it is not mandatory. Most of the sample had parental status recorded suggesting that almost every service user is now asked the question – much higher than was the case in older NDTMS research (Meier et al., 2004). However parents can be fearful of stigma, judgement and social care involvement if they disclose they are a parent (Canfield et al., 2021; Kroll, 2004; Kroll & Taylor, 2003) and so may be less likely to report they have children, particularly at their initial assessment with a worker they do not yet know. It is therefore possible, that the research is biased towards only parents who disclosed both their parental status and child living arrangements and so may not be generalisable to all parents in the treatment system. In a recent study of parental status and characteristics of mothers receiving treatment for SUD in a South London service, Canfield et al. (2021) found that over half (54.3%) of mothers did not disclose whether their children were in their care. It is not clear how generalisable to other English treatment services/ local authorities this finding is, but it does suggest that research on how practitioners should best engage with parents to facilitate parental status disclosure would be beneficial. However, since parental status is predominantly only known to services deciding an individual’s treatment strategy if it has been disclosed, that fact that parental status may not have always been disclosed by individuals in these studies does not materially detract from the applicability of the findings to practice. Furthermore, in relation to child living arrangements being potentially undisclosed, the findings of this thesis support strategies for delivering parenting and/or family recovery support to known parents irrespective of this.

A limitation in the thesis relates to the categorisation of ‘parent not living with children’. It is not possible to determine from the data the level of contact a parent not living with their children has with them. It is possible that some children may be adversely affected by alcohol or drug using parents whom they do not live with, who, as our findings suggest, are more likely to have complex support needs. It is also possible that both child and parent outcomes may differ according to the reason the parent is not living with their child (e.g. if the child is in foster care) and/or whether contact is irregular, infrequent or non-existent. Exploring this further through interviews with families in the treatment system could shed light on this and how treatment responses could differ and be more effective and cost-effective for this cohort.

The substance groupings used in this thesis could present another limitation in enhancing our understanding of the effectiveness and cost-effectiveness of interventions for parents with SUD. As discussed in the methods chapter (chapter 2), these groupings are standard in the English treatment system and NDTMS reporting, however, using aggregated groups may hide some pertinent data in relation to our research questions. For example, within the non-opiate living with children group, are mothers in treatment for cocaine more likely to have complex support needs than those in treatment for cannabis? Such questions could be explored using the NDTMS data in a future research study. However, while it is possible that there would have been differential findings in studies 2 and 3 for non-opiate users if there had been stratification by specific non-opiate substances, the findings for the non-opiate subgroup as a whole, considered alongside findings for the alcohol only subgroup, are suggestive of a generalisable benefit of adopting strategies of providing treatment alongside parenting and/or family recovery support.

The use of ‘successful completion’ as the primary outcome measure is a limitation, as SUD is a chronic health condition which can involve multiple episodes of treatment, abstinence and relapse, which in turn may affect parenting capability over time. Moreover, being in recovery does not necessarily make a ‘good’ parent, just as not being in recovery does not necessarily make a ‘bad’ parent. However, the main outcome measure in the English system is treatment completion. Therefore, by using successful completion of treatment, we are using measures understood by English decision and policymakers.

Ideally, changes in child welfare intervention status would be included as a secondary outcome measure e.g. the step down from one child welfare intervention, such as child protection to another, such as early help. This was not possible using the NDTMS data, but future research could explore this by adopting my original plan for this thesis (see chapter 2). Local treatment and social care datasets could be matched using person identifiers: first and second initial of name, sex, date of birth of parent/ carer, as this is how NDTMS records individual attributable information. The NDTMS data would be used to identify parents or carers and monitor their treatment outcomes. The socio-demographic and clinical data collected in the NDTMS would be used to adjust for potential confounding in the statistical analyses. In addition to treatment, the NDTMS data would be used to identify parents or cares receiving recovery support interventions such as parenting and/or family recovery support. Children’s social care data would be used to identify families involved with early help or who were receiving statutory child welfare interventions such as being on a child in need plan, a child protection plan or a child being placed into care. Time spent in receipt of these interventions between those with parents or carers in treatment would be compared with those with parents or carers not in treatment, to see whether being in treatment is associated with less time spent on an early help/ statutory child welfare intervention, and how this translates into differential costs. If this were not possible, social care resource usage could be captured via a longitudinal survey of parents with SUD in a local authority.

QALY gains were used as the treatment effect in the cost-effectiveness analysis for this thesis, however this was taken from a sample that was not directly comparable to ours. For better comparability, ideally this would be achieved by adding a health survey instrument to the NDTMS reporting and to ask for the survey to be completed once people enter treatment, during their reviews and at the end of treatment. In this way, the robustness of the QALY gains for all the different subgroups and health states in this study would be vastly improved.

While estimated QALY gains in parents are valuable outcomes, they are may not be wholly relevant when regarding the wellbeing of their children (Barlow et al., 2019). Future research in this space should prioritise establishing a willingness to pay per child outcome gained, such as those measured using the BCAP (the Risk Abuse Scale from the Brief Child Abuse Potential Inventory (Ondersma et al., 2005), to be used in economic evaluations. This could involve contingent valuation among stakeholders, where stakeholders are asked to compare various hypothetical scenarios for BCAP.

The thesis only evaluated the cost-effectiveness for parents/ carers with AUD, of treatment plus parenting and/or family recovery support compared with treatment only, for reasons outlined in chapter 2. A similar analysis for non-opiate using parents would be useful in informing local commissioning decisions. The same Markov approach could be used, but different utilities and costs would be needed for each substance as ‘non-opiate use’ is a broad category comprising many diverse substances, such as powder cocaine, crack cocaine, MDMA, methamphetamine and cannabis.

The estimates of public sector savings used were old (2000/01 prices), relied on patient recall and were not the results of treatment plus a parenting programme, but rather alcohol treatment for all adults. Thus, in addition to the above, a research priority would be to update and capture the broad spectrum of societal costs associated with parental treatment for both children and parents. The approach would be to use national administrative databases matched at individual level to NDTMS. This would measure reductions in, for example, hospital admissions (via the Hospital Episodes Statistics database) and offending (via the Police National Computer database). This could be a more robust way of estimating public sector costs as it does not rely on patient recall and the large sample sizes would lower the amount of variance in the observed data. Patients could also be followed up for a long period of time.

Finally, and arguably, the most important recommended research is establishing what precisely constitutes a parenting and/or family recovery support intervention in every local authority. Definitions of early help and statutory child welfare interventions are clear and enshrined in law (HM Government, 2018, 2023). What is being delivered under the banner of ‘parenting and/or family recovery support’ is less clear. The definition given to treatment providers on what qualifies as parenting and/or family recovery support is vague: the NDTMS business definitions state that they can include arranging therapeutic support for families in their own right, referral to a parenting support worker within the treatment service where available, or to a local partner delivering parenting support (PHE, 2019a). It is possible that some areas are not delivering evidence-based interventions, e.g. working with high caseloads, inexperienced staff, not tailoring support to individual and family needs. If these areas were encouraged to do so, this could improve the average treatment effects for parents with SUD, including opiate users, which could be explored through a replica of study 2.

## Conclusion

This PhD has completed three important linked studies and sets out 14 detailed findings which bring novel evidence together as well as 10 research recommendations for the field. The strength of this research is that it adds to the limited evidence base and provides researchers with replicable techniques which could be adopted and adapted in various jurisdictions. Using the recommendations presented in this chapter, policymakers and decision-makers have the best available evidence on how to support families in increasingly financially constrained times.

# References

Advisory Council on the Misuse of Drugs. (2003). *Hidden Harm: Responding to the Needs of Children of Problem Drug Users*. <https://assets.publishing.service.gov.uk/media/5a756e6be5274a3edd9a4dcb/hidden-harm-full.pdf>

Ahlborg, M. G., Nygren, J. M., Svedberg, P., & Regber, S. (2024). Resilience in children of parents with mental illness, alcohol or substance misuse—An integrative review. *Nursing Open*, *11*(6), e2219. <https://doi.org/https://doi.org/10.1002/nop2.2219>

Akin, B. A., Brook, J., Lloyd, M. H., & McDonald, T. P. (2017). Effect of a Parenting Intervention on Foster Care Reentry After Reunification Among Substance-Affected Families: A Quasi-Experimental Study. *Child Maltreatment*, *22*(3), 194-204. <https://doi.org/10.1177/1077559517702743>

Alrouh, B., Abouelenin, M., Broadhurst, K., Cowley, L., Doebler, S., Farr, I., Cusworth, L., North, L., Hargreaves, C., Akabari, A., Griffiths, L., & Ford, D. (2022). *Mothers in recurrent care proceedings: New evidence for England and Wales*. <https://www.nuffieldfjo.org.uk/wp-content/uploads/2022/11/nfjo_eng_report_newborn_recurrence_20221111_final-1.pdf>

Anda, R. F., Whitfield, C. L., Felitti, V. J., Chapman, D., Edwards, V. J., Dube, S. R., & Williamson, D. F. (2002). Adverse childhood experiences, alcoholic parents, and later risk of alcoholism and depression. *Psychiatr Serv*, *53*(8), 1001-1009. <https://doi.org/10.1176/appi.ps.53.8.1001>

Anderson, A. S., Siciliano, R. E., Pillai, A., Jiang, W., & Compas, B. E. (2023). Parental drug use disorders and youth psychopathology: Meta-analytic review. *Drug Alcohol Depend*, *244*, 109793. <https://doi.org/10.1016/j.drugalcdep.2023.109793>

APA. (2022). Substance-Related and Addictive Disorders. In *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition, Text Revision (DSM-5-TR®)*. American Psychiatric Association,. <https://doi.org/10.1176/appi.books.9780890425787.x16_Substance_Related_Disorders>

Barbosa, C., Taylor, B., Godfrey, C., Rehm, J., Parrott, S., & Drummond, C. (2010). Modelling lifetime QALYs and health care costs from different drinking patterns over time: A Markov model. *International Journal of Methods in Psychiatric Research*, *19*(2), 97-109. <https://doi.org/https://doi.org/10.1002/mpr.306>

Barlow, J., Sembi, S., Parsons, H., Kim, S., Petrou, S., Harnett, P., & Dawe, S. (2019). A randomized controlled trial and economic evaluation of the Parents Under Pressure program for parents in substance abuse treatment. *Drug Alcohol Depend*, *194*, 184-194. <https://doi.org/10.1016/j.drugalcdep.2018.08.044>

Barnard, M., & McKeganey, N. (2004). The impact of parental problem drug use on children: What is the problem and what can be done to help? *Addiction*, *99*(5), 552-559. <https://doi.org/10.1111/j.1360-0443.2003.00664.x>

Barrio, P., Reynolds, J., García-Altés, A., Gual, A., & Anderson, P. (2017). Social costs of illegal drugs, alcohol and tobacco in the European Union: A systematic review. *Drug and Alcohol Review*, *36*(5), 578-588. <https://doi.org/https://doi.org/10.1111/dar.12504>

Barth, R. P., Gibbons, C., & Guo, S. (2006). Substance abuse treatment and the recurrence of maltreatment among caregivers with children living at home: A propensity score analysis. *Journal of Substance Abuse Treatment*, *30*(2), 93-104. <https://doi.org/https://doi.org/10.1016/j.jsat.2005.10.008>

Bartu, A., Sharp, J., Ludlow, J., & Doherty, D. A. (2006). Postnatal home visiting for illicit drug‐using mothers and their infants: A randomised controlled trial. *Australian and New Zealand Journal of Obstetrics and Gynaecology*, *46*(5), 419-426. <https://doi.org/10.1111/j.1479-828X.2006.00628.x>

Bellis, M. A., Hughes, K., Leckenby, N., Baban, A., Kachaeva, M., Povilaitis, R., Pudule, I., Qirjako, G., Ulukol, B., Raleva, M., & Terzic, N. (2014). Adverse childhood experiences and associations with health-harming behaviours in young adults: Surveys in eight eastern European countries. *Bulletin of the World Health Organization*, *92*, 641-655. <https://doi.org/http://dx.doi.org/10.2471/BLT.13.129247>

Bellis, M. A., Hughes, K., Leckenby, N., Perkins, C., & Lowey, H. (2014). National household survey of adverse childhood experiences and their relationship with resilience to health-harming behaviors in England. *BMC Medicine*, *12*(72). <https://doi.org/http://dx.doi.org/10.1186/1741-7015-12-72>

Bellis, M. A., Lowey, H., Leckenby, N., Hughes, K., & Harrison, D. (2014). Adverse childhood experiences: retrospective study to determine their impact on adult health behaviours and health outcomes in a UK population. *Journal of Public Health*, *36*(1), 81-91. <https://doi.org/10.1093/pubmed/fdt038>

Belt, R. H., Flykt, M., Punamäki, R.-L., Pajulo, M., Posa, T., & Tamminen, T. (2012). Psychotherapy groups and individual support to enhance mental health and early dyadic interaction among drug-abusing mothers. *Infant mental health journal*, *33*(5), 520-534. <https://doi.org/https://doi.org/10.1002/imhj.21348>

Best, D., & Hennessy, E. A. (2022). The science of recovery capital: Where do we go from here? *Addiction*, *117*(4), 1139-1145. <https://doi.org/https://doi.org/10.1111/add.15732>

Bishai, D., Brenzel, L., & Padula, W. V. (2023). 383 Making models probabilistic and estimating the value of information. In D. Bishai, L. Brenzel, & W. Padula (Eds.), *Handbook of Applied Health Economics in Vaccines* (pp. 0). Oxford University Press. <https://doi.org/10.1093/oso/9780192896087.005.0006>

Black, C. (2021). *Review of drugs part two: prevention, treatment, and recovery*. Department of Health and Social Care Retrieved from <https://www.gov.uk/government/publications/review-of-drugs-phase-two-report>

Boles, S. M., Young, N. K., Moore, T., & DiPirro-Beard, S. (2007). The Sacramento Dependency Drug Court: Development and Outcomes. *Child Maltreatment*, *12*(2), 161-171. <https://doi.org/10.1177/1077559507300643>

Bonin, E.-M., Stevens, M., Beecham, J., Byford, S., & Parsonage, M. (2011). Costs and longer-term savings of parenting programmes for the prevention of persistent conduct disorder: A modelling study. *BMC public health*, *11*(1), 803. <https://doi.org/10.1186/1471-2458-11-803>

Brandon, M., Sidebotham, P., Belderson, P., Cleaver, H., Dickens, J., Garstang, J., Harris, J., Sorensen, P., & Wate, R. (2020). *Complexity and challenge: a triennial analysis of SCRs. 2014-2017. Final report*. Department for Education Retrieved from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/869586/TRIENNIAL_SCR_REPORT_2014_to_2017.pdf>

Briggs, A. H., Ades, A. E., & Price, M. J. (2003). Probabilistic sensitivity analysis for decision trees with multiple branches: Use of the Dirichlet distribution in a Bayesian framework. *Med Decis Making*, *23*(4), 341-350. <https://doi.org/10.1177/0272989x03255922>

Broadhurst, K., & Mason, C. (2020). Child removal as the gateway to further adversity: Birth mother accounts of the immediate and enduring collateral consequences of child removal. *Qualitative Social Work*, *19*(1), 15-37. <https://doi.org/10.1177/1473325019893412>

Brown, S. M., Bender, K. A., Bellamy, J. L., Garland, E. L., Dmitrieva, J., & Jenson, J. M. (2021). Correction to: A Pilot Randomized Trial of a Mindfulness-Informed Intervention for Child Welfare-Involved Families. *Mindfulness*, *12*(2), 436-437. <https://doi.org/10.1007/s12671-018-1025-x>

Bruns, E. J., Pullmann, M. D., Weathers, E. S., Wirschem, M. L., & Murphy, J. K. (2012). Effects of a Multidisciplinary Family Treatment Drug Court on Child and Family Outcomes: Results of a Quasi-Experimental Study. *Child Maltreatment*, *17*(3), 218-230. <https://doi.org/10.1177/1077559512454216>

Burgette, L., Griffin, B. A., & McCaffrey, D. (2021). Propensity scores for multiple treatments: A tutorial for the mnps function in the twang package. <https://cran.r-project.org/web/packages/twang/vignettes/mnps.pdf>

Burkinshaw, P., Knight, J., Anders, P., Eastwood, B., Musto, V., White, M., & Marsden, J. (2017). An Evidence Review of the Outcomes that can be Expected of Drug Misuse Treatment in England. Retrieved 04/02/17, from <https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/586111/PHE_Evidence_review_of_drug_treatment_outcomes.pdf>

Burrus, S. W. M., Mackin, J. R., & Finigan, M. W. (2011). Show Me the Money: Child Welfare Cost Savings of a Family Drug Court. *Juvenile and Family Court Journal*, *62*(3), 1-14.

Burton, R., Henn, C., Lavoie, D., O'Connor, R., Perkins, C., Sweeney, K., Greaves, F., Ferguson, B., Beynon, C., Belloni, A., Musto, V., Marsden, J., & Sheron, N. (2016). A Rapid Evidence Review of the Effectiveness and Cost-effectiveness of Alcohol Control Policies: An English perspective. *The Lancet*, *389*(10078), 1558–1580. <https://doi.org/10.1016/S0140-6736(16)32420-5>

Burton, R., Henn, C., Lavoie, D., O’Connor, R., Perkins, C., Sweeney, K., Greaves, F., Ferguson, B., Beynon, C., Belloni, A., Musto, V., Marsden, J., Sheron, N., & Wolff, A. (2016). The Public Health Burden of Alcohol and the Effectiveness and Cost-Effectiveness of Alcohol Control Policies: An evidence review. Retrieved 15/03/2024, from <https://assets.publishing.service.gov.uk/media/5b6c5703ed915d3119112af6/alcohol_public_health_burden_evidence_review_update_2018.pdf>

Butchart, A., & Harvey, A. P. (2006). Preventing child maltreatment: a guide to taking action and generating evidence. In. France: WHO and International Society for Prevention of Child Abuse and Neglect.

Campbell, S., & Harper, G. (2012). Quality in policy impact evaluation: understanding the effects of policy from other influences (supplementary Magenta Book guidance). Retrieved 15/06/18, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/190984/Magenta_Book_quality_in_policy_impact_evaluation__QPIE_.pdf>

Canfield, M., Norton, S., Downs, J., & Gilchrist, G. (2021). Parental status and characteristics of women in substance use treatment services: Analysis of electronic patient records. *Journal of Substance Abuse Treatment*, *127*, 108365. <https://doi.org/https://doi.org/10.1016/j.jsat.2021.108365>

Canfield, M., Radcliffe, P., Marlow, S., Boreham, M., & Gilchrist, G. (2017). Maternal substance use and child protection: A rapid evidence assessment of factors associated with loss of child care. *Child Abuse & Neglect*, *70*, 11-27. <https://doi.org/https://doi.org/10.1016/j.chiabu.2017.05.005>

Cefalu, M. (2006). TWANG: Toolkit for Weighting and Analysis of Nonequivalent Groups. R package version 2.5. <https://cran.r-project.org/web/packages/twang>

Children's Commissioner. (2024). Children on child in need plans. Retrieved 01/04/2024, from <https://assets.childrenscommissioner.gov.uk/wpuploads/2024/03/Childreninneedreport.pdf>

Choi, S., Rosenbloom, D., Stein, M. D., Raifman, J., & Clark, J. A. (2022). Differential Gateways, Facilitators, and Barriers to Substance Use Disorder Treatment for Pregnant Women and Mothers: A Scoping Systematic Review. *J Addict Med*, *16*(3), e185-e196. <https://doi.org/10.1097/adm.0000000000000909>

Chuang, E., Moore, K., Barrett, B., & Young, M. S. (2012). Effect of an integrated family dependency treatment court on child welfare reunification, time to permanency and re-entry rates. *Children and Youth Services Review*, *34*(9), 1896-1902. <https://doi.org/https://doi.org/10.1016/j.childyouth.2012.06.001>

Clark, M. C., Buswell, J., Gold, C., & Peacock-Chambers, E. (2021). A Triple Threat: Parents in Recovery During COVID-19. *Journal of Addiction Medicine*, *15*(6), 446-447. <https://doi.org/10.1097/adm.0000000000000790>

Cleaver, H., Unell, I., & Aldgate, J. (2011). *Children's need - Parenting capacity. Child abuse: parental mental illness , learning disabilty, substance misuse and domestic violence. 2nd edition.* TSO.

Cloud, W., & Granfield, R. (2008). Conceptualizing Recovery Capital: Expansion of a Theoretical Construct. *Substance Use & Misuse*, *43*(12-13), 1971-1986. <https://doi.org/10.1080/10826080802289762>

Coffman, D. L., Zhou, J., & Cai, X. (2020). Comparison of methods for handling covariate missingness in propensity score estimation with a binary exposure. *BMC Medical Research Methodology*, *20*(1), 168. <https://doi.org/10.1186/s12874-020-01053-4>

Cooke, J. E., Kochendorfer, L. B., Stuart-Parrigon, K. L., Koehn, A. J., & Kerns, K. A. (2019). Parent–child attachment and children’s experience and regulation of emotion: A meta-analytic review. *Emotion*, *19*(6), 1103-1126. <https://doi.org/10.1037/emo0000504>

Copello, A. G., Velleman, R. D. B., & Templeton, L. J. (2005). Family interventions in the treatment of alcohol and drug problems. *Drug and Alcohol Review*, *24*(4), 369-385. <https://doi.org/https://doi.org/10.1080/09595230500302356>

Corr, T. E., & Hollenbeak, C. S. (2017). The economic burden of neonatal abstinence syndrome in the United States. *Addiction*, *112*(9), 1590-1599. <https://doi.org/10.1111/add.13842>

Coyle, M. G., Salisbury, A. L., Lester, B. M., Jones, H. E., Lin, H., Graf-Rohrmeister, K., & Fischer, G. (2012). Neonatal neurobehavior effects following buprenorphine versus methadone exposure. *Addiction*, *107*(S1), 63-73. <https://doi.org/https://doi.org/10.1111/j.1360-0443.2012.04040.x>

Crack, C., Gardner, J., & Ghosh, D. (2015). Brighton Oasis Project: POCAR programme evaluation. Retrieved 04/09/2024, from <https://www.oasisproject.org.uk/wp-content/uploads/2020/12/Brighton-Oasis-evaluation-FINAL.pdf>

Crawford, T. N., Cohen, P. R., Chen, H., Anglin, D. M., & Ehrensaft, M. (2009). Early maternal separation and the trajectory of borderline personality disorder symptoms. *Development and Psychopathology*, *21*(3), 1013-1030. <https://doi.org/10.1017/S0954579409000546>

Dakof, G. A., Cohen, J. B. J. D., Henderson, C. E., Duarte, E. M. A., Boustani, M. M. S., Blackburn, A. B. A., Venzer, E. J. D., & Hawes, S. M. S. (2010). A randomized pilot study of the Engaging Moms Program for family drug court. *Journal of Substance Abuse Treatment*, *38*(3), 263. <https://doi.org/https://doi.org/10.1016/j.jsat.2010.01.002>

Damashek, A., Williams, N. A., Sher, K., & Peterson, L. (2009). Relation of Caregiver Alcohol Use to Unintentional Childhood Injury. *Journal of Pediatric Psychology*, *34*(4), 344-353. <https://doi.org/10.1093/jpepsy/jsn097>

Darlington, C. K., Clark, R., Jacoby, S. F., Terplan, M., Alexander, K., & Compton, P. (2023). Outcomes and experiences after child custody loss among mothers who use drugs: A mixed studies systematic review. *Drug Alcohol Depend*, *251*, 110944. <https://doi.org/https://doi.org/10.1016/j.drugalcdep.2023.110944>

Dauber, S., Neighbors, C., Dasaro, C., Riordan, A., & Morgenstern, J. (2012). Impact of intensive case management on child welfare system involvement for substance-dependent parenting women on public assistance. *Children and Youth Services Review*, *34*(7), 1359-1366. <https://doi.org/http://dx.doi.org/10.1016/j.childyouth.2012.03.020>

Dawe, S., & Harnett, P. (2007). Reducing potential for child abuse among methadone-maintained parents: results from a randomized controlled trial. *32*, 381-390. <https://doi.org/10.1016/j.jsat.2006.10.003>

Dawe, S., Taplin, S., & Mattick, R. P. (2017). Psychometric investigation of the Brief Child Abuse Potential Inventory in mothers on opioid substitution therapy. *32*, 341-348. <https://doi.org/10.1007/s10896-016-9821-3>

Dawson, D. A., Goldstein, R. B., & Grant, B. F. (2007). Rates and Correlates of Relapse Among Individuals in Remission From DSM-IV Alcohol Dependence: A 3-Year Follow-Up. *Alcoholism: Clinical and Experimental Research*, *31*(12), 2036-2045. <https://doi.org/https://doi.org/10.1111/j.1530-0277.2007.00536.x>

Day, C., Briskman, J., Crawford, M. J., Foote, L., Harris, L., Boadu, J., McCrone, P., McMurran, M., Michelson, D., Moran, P., Mosse, L., Scott, S., Stahl, D., Ramchandani, P., & Weaver, T. (2020). An intervention for parents with severe personality difficulties whose children have mental health problems: a feasibility RCT. *Health Technol Assess*, *24*(14), 1-188. <https://doi.org/10.3310/hta24140>

DCLG. (2012). Working with Troubled Families. A guide to the evidence and good practice. Retrieved 15/06/2019, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/66113/121214_Working_with_troubled_families_FINAL_v2.pdf>

Degenhardt, L., Charlson, F., Ferrari, A., Santomauro, D., Erskine, H., Mantilla-Herrara, A., Whiteford, H., Leung, J., Naghavi, M., Griswold, M., Rehm, J., Hall, W., Sartorius, B., Scott, J., Vollset, S. E., Knudsen, A. K., Haro, J. M., Patton, G., Kopec, J., . . . Vos, T. (2018). The global burden of disease attributable to alcohol and drug use in 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet Psychiatry*, *5*(12), 987-1012. <https://doi.org/https://doi.org/10.1016/S2215-0366(18)30337-7>

Department of Health. (2017). Drug misuse and dependence: UK guidelines on clinical management. Update 2017. Retrieved 26/04/2019, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/673978/clinical_guidelines_2017.pdf>

DfE. (2021). *Vulnerable Children and Young People Survey: Summary of returns Waves 1 to 17*. Department for Education Retrieved from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/957499/Vulnerable_children_and_young_people_survey_-_waves_1_to_17_-_Feb_2021.pdf>

DfE. (2023). *Reporting year 2023. Children in need* <https://explore-education-statistics.service.gov.uk/find-statistics/characteristics-of-children-in-need/2023#explore-data-and-files>

Díaz, R., Gual, A., García, M., Arnau, J., Pascual, F., Cañuelo, B., Rubio, G., de Dios, Y., Fernández-Eire, M. C., Valdés, R., & Garbayo, I. (2008). Children of alcoholics in Spain: from risk to pathology. Results from the ALFIL program. *Soc Psychiatry Psychiatr Epidemiol*, *43*(1), 1-10. <https://doi.org/10.1007/s00127-007-0264-2>

Donohue, B., Azrin, N. H., Bradshaw, K., Van Hasselt, V. B., Cross, C. L., Urgelles, J., Romero, V., Hill, H. H., & Allen, D. N. (2014). A controlled evaluation of family behavior therapy in concurrent child neglect and drug abuse [Journal article]. *Journal of consulting and clinical psychology*, *82*(4), 706‐720. <https://doi.org/10.1037/a0036920>

Douglas-Siegel, J. A., & Ryan, J. P. (2013). The effect of recovery coaches for substance-involved mothers in child welfare: Impact on juvenile delinquency. *Journal of Substance Abuse Treatment*, *45*(4), 381-387. <https://doi.org/http://dx.doi.org/10.1016/j.jsat.2013.05.010>

Dretzke, J., Davenport, C., Frew, E., Barlow, J., Stewart-Brown, S., Bayliss, S., Taylor, R. S., Sandercock, J., & Hyde, C. (2009). The clinical effectiveness of different parenting programmes for children with conduct problems: a systematic review of randomised controlled trials. *Child and adolescent psychiatry and mental health*, *3*, 1-10.

Eastwood, B. (2019). The long-term impact of treatment for individuals presenting to specialist services in England with opioid addiction problems. <https://kclpure.kcl.ac.uk/portal/en/studentTheses/the-long-term-impact-of-treatment-for-individuals-presenting-to-s>

Eastwood, B., Peacock, A., Millar, T., Jones, A., Knight, J., Horgan, P., Lowden, T., Willey, P., & Marsden, J. (2018). Effectiveness of inpatient withdrawal and residential rehabilitation interventions for alcohol use disorder: A national observational, cohort study in England. *Journal of Substance Abuse Treatment*, *88*, 1-8. <https://doi.org/10.1016/j.jsat.2018.02.001>

Eastwood, B., Strang, J., & Marsden, J. (2017). Effectiveness of treatment for opioid use disorder: A national, five-year, prospective, observational study in England. *Drug Alcohol Depend*, *176*, 139-147. <https://doi.org/10.1016/j.drugalcdep.2017.03.013>

Edwards, R. T., Jones, C., Berry, V., Charles, J., Linck, P., Bywater, T., & Hutchings, J. (2016). Incredible Years parenting programme: cost-effectiveness and implementation. *Journal of Children's Services*, *11*(1), 54-72. <https://doi.org/10.1108/JCS-02-2015-0005>

El-Banna, A., Petrou, S., Yiu, H. H. E., Daher, S., Forrester, D., Scourfield, J., Wilkins, D., Evans, R., Turley, R., & Wallace, S. (2021). Systematic review of economic evaluations of children’s social care interventions. *Children and Youth Services Review*, *121*. <https://doi.org/https://doi.org/10.1016/j.childyouth.2020.105864>

Evans, A., Hardcastle, K., Bandyopadhyay, A., Farewell, D., John, A., Lyons, R. A., Long, S., Bellis, M. A., & Paranjothy, S. (2020). Adverse childhood experiences during childhood and academic attainment at age 7 and 11 years: an electronic birth cohort study. *Public Health*, *189*, 37-47. <https://doi.org/https://doi.org/10.1016/j.puhe.2020.08.027>

Farhoudian, A., Razaghi, E., Hooshyari, Z., Noroozi, A., Pilevari, A., Mokri, A., Mohammadi, M. R., & Malekinejad, M. (2022). Barriers and Facilitators to Substance Use Disorder Treatment: An Overview of Systematic Reviews. *Substance Abuse: Research and Treatment*, *16*, 11782218221118462. <https://doi.org/10.1177/11782218221118462>

Fink, B., Landthaler, M., & Hafner, C. (2011). Skin alterations due to illegal drug abuse. *JDDG: Journal der Deutschen Dermatologischen Gesellschaft*, *9*(8), 633-639. <https://doi.org/https://doi.org/10.1111/j.1610-0387.2011.07699.x>

Fischer, G., Ortner, R., Rohrmeister, K., Jagsch, R., Baewert, A., Langer, M., & Aschauer, H. (2006). Methadone versus buprenorphine in pregnant addicts: a double-blind, double-dummy comparison study. *Addiction*, *101*(2), 275-281. <https://doi.org/http://dx.doi.org/10.1111/j.1360-0443.2006.01321.x>

Forrester, D., Copello, A., Waissbein, C., & Pokhrel, S. (2008). Evaluation of an intensive family preservation service for families affected by parental substance misuse. *Child Abuse Review*, *17*(6), 410-426. <https://doi.org/10.1002/car.1048>

Forrester, D., & Harwin, J. (2006). Parental substance misuse and child care social work: findings from the first stage of a study of 100 families. *Child & Family Social Work*, *11*(4), 325-335. <https://doi.org/https://doi.org/10.1111/j.1365-2206.2006.00415.x>

Forrester, D., Holland, S., Williams, A., & Copello, A. (2014). Helping families where parents misuse drugs or alcohol? A mixed methods comparative evaluation of an intensive family preservation service. *Child & Family Social Work*, *21*(1), 65-75. <https://doi.org/doi:10.1111/cfs.12111>

Foster, D. (2023). Supporting Families. Research Briefing. Retrieved 04/04/2024, from <https://researchbriefings.files.parliament.uk/documents/CBP-7585/CBP-7585.pdf>

Franklin, J., Larkham, J., & Mansoor, M. (2023). The well-worn path: Children’s services spending 2010-11 to 2021-22. <https://www.probonoeconomics.com/Handlers/Download.ashx?IDMF=64274c2e-73c3-4364-b995-4b31b6825dd8>

Galvani, S., & Forrester, D. (2011). Social Work Services and Recovery from Substance Misuse: A review of the evidence. Retrieved 21/01/17, from <http://www.gov.scot/Publications/2011/03/18085806/0>

Gifford, E. J., Eldred, L. M., Vernerey, A., & Sloan, F. A. (2014). How does family drug treatment court participation affect child welfare outcomes? *Child Abuse & Neglect*, *38*(10), 1659-1670. <https://doi.org/https://doi.org/10.1016/j.chiabu.2014.03.010>

Gifford, E. J., Sloan, F. A., Eldred, L. M., & Evans, K. E. (2015). Intergenerational effects of parental substance-related convictions and adult drug treatment court participation on children’s school performance. *American Journal of Orthopsychiatry*, *85*(5), 452-468. <https://doi.org/10.1037/ort0000087>

Gossop, M., Trakada, K., Stewart, D., & Witton, J. (2005). Reductions in criminal convictions after addiction treatment: 5-year follow-up. *Drug Alcohol Depend*, *79*(3), 295-302. <https://doi.org/https://doi.org/10.1016/j.drugalcdep.2005.01.023>

Graham, J. W., Olchowski, A. E., & Gilreath, T. D. (2007). How many imputations are really needed? Some practical clarifications of multiple imputation theory. *Prev Sci*, *8*(3), 206-213. <https://doi.org/10.1007/s11121-007-0070-9>

Granfield, R., & Cloud, W. (2001). Social context and “Natural Recovery”: The role of social capital in the resolution of drug-associated problems. *Substance Use & Misuse*, *36*(11), 1543-1570. <https://doi.org/10.1081/JA-100106963>

Grant, T. M., Ernst, C. C., Streissguth, A., & Stark, K. (2005). Preventing Alcohol and Drug Exposed Births in Washington State: Intervention Findings From Three Parent-Child Assistance Program Sites. *The American Journal of Drug and Alcohol Abuse*, *31*(3), 471-490. <https://doi.org/10.1081/ADA-200056813>

Green, B. L., Furrer, C., Worcel, S., Burrus, S., & Finigan, M. W. (2007). How Effective Are Family Treatment Drug Courts? Outcomes From a Four-Site National Study. *Child Maltreatment*, *12*(1), 43-59. <https://doi.org/10.1177/1077559506296317>

Green, K. M., & Stuart, E. A. (2014). Examining Moderation Analyses in Propensity Score Methods: Application to Depression and Substance Use. *J Consult Clin Psychol*, *82*(5), 773-783. <https://doi.org/10.1037/a0036515>

Greenmyer, J. R., Klug, M., G., Kambeitz, C., Popova, S., & Burd, L. (2018). *A Multicountry Updated Assessment of the Economic Impact of Fetal Alcohol Spectrum Disorder: Costs for Children and Adults* (Vol. 12). <https://doi.org/10.1097/ADM.0000000000000438>

Greifer, N., & Stuart, E. A. (2021). Choosing the Causal Estimand for Propensity Score Analysis of Observational Studies. <https://doi.org/10.48550/arxiv.2106.10577>

Grella, C. E., Hser, Y.-I., & Huang, Y.-C. (2006). Mothers in substance abuse treatment: differences in characteristics based on involvement with child welfare services. *Child Abuse & Neglect*, *30*(1), 55-73. <http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=med5&NEWS=N&AN=16406024>

Griffin, B. A., McCaffrey, D., Almirall, D., Setodji, C., & Burgette, L. (2017). Chasing balance and other recommendations for improving nonparametric propensity score models. *J Causal Inference*, *5*(2). <https://doi.org/10.1515/jci-2015-0026>

Griffin, B. A., Story, C., Sanchez, R., Cefalu, M., & McCaffrey, D. F. (2020). *Toolkit for Weighting and Analysis of Nonequivalent Groups: A Tutorial on the TWANG Shiny Application for Three or More Treatment Groups*. RAND Corporation. <https://doi.org/10.7249/TLA570-1>

Griswold, M. G., Fullman, N., Hawley, C., Arian, N., Zimsen, S. R. M., Tymeson, H. D., Venkateswaran, V., Tapp, A. D., Forouzanfar, M. H., Salama, J. S., Abate, K. H., Abate, D., Abay, S. M., Abbafati, C., Abdulkader, R. S., Abebe, Z., Aboyans, V., Abrar, M. M., Acharya, P., . . . Gakidou, E. (2018). Alcohol use and burden for 195 countries and territories, 1990–2016: A systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, *392*(10152), 1015-1035. <https://doi.org/10.1016/S0140-6736(18)31310-2>

Gunn, A., & Miranda Samuels, G. (2020). Promoting Recovery Identities Among Mothers with Histories of Addiction: Strategies of Family Engagement. *Family Process*, *59*(1), 94-110. <https://doi.org/https://doi.org/10.1111/famp.12413>

Gutman, L. M., Joshi, H., Khan, L., & Schoon, I. (2018). Children of the millennium. *London: Centre for Mental Health*.

Guyatt, G. H., Oxman, A. D., Schünemann, H. J., Tugwell, P., & Knottnerus, A. (2010). GRADE guidelines: A new series of articles in the Journal of Clinical Epidemiology. *Journal of Clinical Epidemiology*, *64*(4), 380-382. <https://doi.org/10.1016/j.jclinepi.2010.09.011>

10.1016/j.jclinepi.2010.09.011</p>

Guyatt, G. H., Oxman, A. D., Vist, G. E., Kunz, R., Falck-Ytter, Y., Alonso-Coello, P., & Schünemann, H. J. (2008). GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. *BMJ*, *336*(7650), 924-926. <https://doi.org/10.1136/bmj.39489.470347.AD>

Gwadz, M. V., Leonard, N. R., Cleland, C. M., Riedel, M., Arredondo, G. N., Wolfe, H., Hardcastle, E., & Morris, J. (2008). Behavioral interventions for HIV infected and uninfected mothers with problem drinking. *Addiction Research & Theory*, *16*(1), 47-65. <https://doi.org/10.1080/16066350701651214>

Harwin, J., Alrouh, B., Broadhurst, K., McQuarrie, T., Golding, L., & Ryan, M. (2018). Child and Parent Outcomes in the London Family Drug and Alcohol Court Five Years On: Building on International Evidence. *International Journal of Law, Policy and the Family*(0), 1-30. <https://doi.org/10.1093/lawfam/eby006>

Harwin, J., Alrouh, B., Ryan, M., McQuarrie, T., Golding, L., Broadhurst, K., Tunnard, J., & Swift, S. (2016). After FDAC: Outcomes 5 years later. In. Lancaster: Lancaster University.

Harwin, J., Alrouh, B., Ryan, M., & Tunnard, J. (2014). Changing Lifestyles, Keeping Children Safe: An evaluation of the first Family Drug and Alcohol Court (FDAC) in care proceedings.

Hatzis, D., Dawe, S., Harnett, P., & Barlow, J. (2017). Quality of Caregiving in Mothers With Illicit Substance Use: A Systematic Review and Meta-analysis. *Substance Abuse: Research and Treatment*, *11*, 1178221817694038-1178221817694038. <https://doi.org/10.1177/1178221817694038>

Health & Medicine Policy Research Group. (2018). The Parent-Child Dyad in the Context of Child Development and Child Health. Retrieved 26/03/2024, from <https://hmprg.org/wp-content/uploads/2018/07/ILARC_Parent-Child-Dyad-Report.pdf>

Hindley, N., Ramchandani, P. G., & Jones, D. P. H. (2006). Risk factors for recurrence of maltreatment: A systematic review. *Archives of Disease in Childhood*, *91*(9), 744-752. <https://doi.org/10.1136/adc.2005.085639>

HM Government. (2018). Working Together to Safeguard Children: A guide to inter-agency working to safeguard and promote the welfare of children. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/779401/Working_Together_to_Safeguard-Children.pdf>

HM Government. (2023). Working Together to Safeguard Children 2023. A guide to multi-agency working to help, protect and promote the welfare of children. Retrieved 01/04/2024, from <https://assets.publishing.service.gov.uk/media/65cb4349a7ded0000c79e4e1/Working_together_to_safeguard_children_2023_-_statutory_guidance.pdf>

HM Treasury. (2022). *The Green Book: Central Government guidance on appraisal and evaluation*. London: HM Treasury,

HM Treasury and Evaluation Task Force. (2011). Government analytical evaluation capabilities framework. Retrieved 28/05/2024, from <https://assets.publishing.service.gov.uk/media/5e96c443e90e071a13b0892e/Magenta_Book_supplementary_guide._Government_Analytical_Evaluation_Capabilities_Framework.pdf>

Hood, R., Goldacre, A., Jones, E., Martin, E., Clements, K., & Webb, C. (2024). Intervention Pathways following a Social Work Assessment: An Analysis of National Administrative Data for Children’s Social Care in England. *The British Journal of Social Work*, *54*(7), 2937-2956. <https://doi.org/10.1093/bjsw/bcae070>

Hornor, G. (2017). Resilience. *Journal of Pediatric Health Care*, *31*(3), 384-390. <https://doi.org/https://doi.org/10.1016/j.pedhc.2016.09.005>

Huang, H., & Ryan, J. P. (2011). Trying to come home: Substance exposed infants, mothers, and family reunification. *Children and Youth Services Review*, *33*(2), 322-329. <https://EconPapers.repec.org/RePEc:eee:cysrev:v:33:y:2011:i:2:p:322-329>

Huebner, R. A., Willauer, T., & Posze, L. (2012). The Impact of Sobriety Treatment and Recovery Teams (START) on Family Outcomes. *Families in Society*, *93*(3), 196-203. <https://doi.org/10.1606/1044-3894.4223>

Hughes, K., Bellis, M. A., Hardcastle, K. A., Sethi, D., Butchart, A., Mikton, C., Jones, L., & Dunne, M. P. (2017). The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. *Lancet Public Health*, *2*(8), e356-e366. <https://doi.org/10.1016/s2468-2667(17)30118-4>

Hughes, K., Ford, K., Kadel, R., Sharp, C. A., & Bellis, M. A. (2020). Health and financial burden of adverse childhood experiences in England and Wales: A combined primary data study of five surveys. *BMJ Open*, *10*(6), e036374. <https://doi.org/10.1136/bmjopen-2019-036374>

Hughes, R. A., Heron, J., Sterne, J. A. C., & Tilling, K. (2019). Accounting for missing data in statistical analyses: multiple imputation is not always the answer. *International Journal of Epidemiology*, *48*(4), 1294-1304. <https://doi.org/10.1093/ije/dyz032>

Huq, T., Alexander, E. C., Manikam, L., Jokinen, T., Patil, P., Benjumea, D., Das, I., & Davidson, L. L. (2021). A Systematic Review of Household and Family Alcohol Use and Childhood Neurodevelopmental Outcomes in Low- and Middle-Income Countries. *Child Psychiatry Hum Dev*, *52*(6), 1194-1217. <https://doi.org/10.1007/s10578-020-01112-3>

Ilyka, D., Johnson, M. H., & Lloyd-Fox, S. (2021). Infant social interactions and brain development: A systematic review. *Neuroscience & Biobehavioral Reviews*, *130*, 448-469. <https://doi.org/https://doi.org/10.1016/j.neubiorev.2021.09.001>

Institute for Government. (2022). *Timeline of UK government coronavirus lockdowns and restrictions*. Institute for Government,. Retrieved 26/08/2024 from <https://www.instituteforgovernment.org.uk/sites/default/files/2022-12/timeline-coronavirus-lockdown-december-2021.pdf>

Itäpuisto, M. S. (2014). Helping the children of substance-abusing parents in the context of outpatient substance abuse treatment. *Addiction Research & Theory*, *22*(6), 498-504. <https://doi.org/10.3109/16066359.2014.892930>

Jääskeläinen, M., Holmila, M., Notkola, I.-L., & Raitasalo, K. (2016). A typology of families with parental alcohol or drug abuse. *Addiction Research & Theory*, *24*(4), 288-299. <https://doi.org/10.3109/16066359.2015.1127358>

Jackson, C. (2011). Multi-State Models for Panel Data: The msm Package for R. *Journal of Statistical Software*, *38*(8), 1 - 28. <https://doi.org/10.18637/jss.v038.i08>

Jansson, L. M., Svikis, D. S., Breon, D., & Cieslak, R. (2005). Intensity of Case Management Services: Does More Equal Better for Drug Dependent Women and Their Children? *Social Work in Mental Health*, *3*(4), 63-78. <https://doi.org/10.1300/J200v03n04_04>

Jones, H. E., Johnson, R. E., Jasinski, D. R., O'Grady, K. E., Chisholm, C. A., Choo, R. E., Crocetti, M., Dudas, R., Harrow, C., Huestis, M. A., Jansson, L. M., Lantz, M., Lester, B. M., & Milio, L. (2005). Buprenorphine versus methadone in the treatment of pregnant opioid-dependent patients: effects on the neonatal abstinence syndrome. *Drug Alcohol Depend*, *79*(1), 1-10. <https://doi.org/10.1016/j.drugalcdep.2004.11.013>

Jones, H. E., O’Grady, K. E., & Tuten, M. (2011). Reinforcement-Based Treatment Improves the Maternal Treatment and Neonatal Outcomes of Pregnant Patients Enrolled in Comprehensive Care Treatment. *The American Journal on Addictions*, *20*(3), 196-204. <https://doi.org/doi:10.1111/j.1521-0391.2011.00119.x>

Kendall, S., Rodger, J., & Palmer, H. (2010). Redesigning provision for families with multiple problems – an assessment of the early impact of different local approaches. Research Report DFE-RR046. Retrieved 15/06/2019, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/181692/DFE-RR046.pdf>

Kendler, K. S., Gardner, C. O., Edwards, A., Hickman, M., Heron, J., Macleod, J., Lewis, G., & Dick, D. M. (2013). Dimensions of Parental Alcohol Use/Problems and Offspring Temperament, Externalizing Behaviors, and Alcohol Use/Problems. *Alcoholism: Clinical and Experimental Research*, *37*(12), 2118-2127. <https://doi.org/https://doi.org/10.1111/acer.12196>

Kepple, N. J. (2018). Does parental substance use always engender risk for children? Comparing incidence rate ratios of abusive and neglectful behaviors across substance use behavior patterns. *Child Abuse & Neglect*, *76*, 44-55. <https://doi.org/https://doi.org/10.1016/j.chiabu.2017.09.015>

Knight, J., Brand, P., van der Merwe, J., & Eastwood, B. (2018). Adult substance misuse statistics from the National Drug Treatment Monitoring System (NDTMS): 1 April 2017 to 31 March 2018 [06/06/2019]. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/752993/AdultSubstanceMisuseStatisticsfromNDTMS2017-18.pdf>

Knight, J., Brand, P., Willey, P., & van de Merwe, J. (2017). Adult substance misuse statistics from the National Drug Treatment Monitoring System (NDTMS). 1 April 2016 to 31 March 2017. Retrieved 16/07/2019, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/658056/Adult-statistics-from-the-national-drug-treatment-monitoring-system-2016-2017.pdf>

Knight, K. E., Menard, S., & Simmons, S. B. (2014). Intergenerational Continuity of Substance Use. *Substance Use & Misuse*, *49*(3), 221-233. <https://doi.org/10.3109/10826084.2013.824478>

Kroll, B. (2004). Living with an elephant: Growing up with parental substance misuse. *Child & Family Social Work*, *9*(2), 129-140. <https://doi.org/10.1111/j.1365-2206.2004.00325.x>

Kroll, B., & Taylor, A. (2003). *Parental substance misuse and child welfare*. Jessica Kingsley Publishers.

Kydd, S., & Roe, N. (2012). A better future for families: The importance of family-based interventions in tackling substance misuse. The Breaking the Cycle Commission. Retrieved 03/11/2018., from <https://www.addaction.org.uk/sites/default/files/public/attachments/the_breaking_the_cycle_commission_2mb_0.pdf>

Lam, W. K. K., Fals-Stewart, W., & Kelley, M. L. (2009). Parent Training With Behavioral Couples Therapy for Fathers' Alcohol Abuse. *Child Maltreatment*, *14*(3), 243-254. <https://doi.org/http://dx.doi.org/10.1177/1077559509334091>

Lander, L. R., Gurka, K. K., Marshalek, P. J., Riffon, M., & Sullivan, C. R. (2015). A Comparison of Pregnancy-Only versus Mixed-Gender Group Therapy among Pregnant Women with Opioid Use Disorder. *Social Work Research*, *39*(4), 235.

Laramée, P., Kusel, J., Leonard, S., Aubin, H.-J., François, C., & Daeppen, J.-B. (2013). The Economic Burden of Alcohol Dependence in Europe. *Alcohol and Alcoholism*, *48*(3), 259-269. <https://doi.org/10.1093/alcalc/agt004>

Lee, J. J. N., Cataldo, I., Coppola, A., Corazza, O., & Esposito, G. (2021). Mind the dad–A review on the biopsychosocial influences of drug abuse on father-infant interaction. *Emerging Trends in Drugs, Addictions, and Health*, *1*, 100015. <https://doi.org/https://doi.org/10.1016/j.etdah.2021.100015>

Li, C. (2013). Little's Test of Missing Completely at Random. *The Stata Journal*, *13*(4), 795-809. <https://doi.org/10.1177/1536867X1301300407>

Linden, A., Mathur, M. B., & VanderWeele, T. J. (2020). Conducting sensitivity analysis for unmeasured confounding in observational studies using E-values: The evalue package. *The Stata Journal*, *20*(1), 162-175. <https://doi.org/10.1177/1536867x20909696>

Little, R. J. A. (1988). A Test of Missing Completely at Random for Multivariate Data with Missing Values. *Journal of the American Statistical Association*, *83*(404), 1198-1202. <https://doi.org/10.1080/01621459.1988.10478722>

Localio, A. R., Stack, C., & Griswold, M. (2017). Sensitivity Analysis for Unmeasured Confounding: E-Values for Observational Studies. *Annals of Internal Medicine*, *167*(4), 285-undefined. <https://doi.org/10.7326/M17-1485>

Long, F. C., & Jepsen, K. S. (2023). Situating Stigma: An Ethnographic Exploration of How Stigma Arises in Interactions at Different Stages of People’s Drug Use Journeys. *International Journal of Environmental Research and Public Health*, *20*(19), 6894. <https://www.mdpi.com/1660-4601/20/19/6894>

Lowthian, E. (2022). The Secondary Harms of Parental Substance Use on Children’s Educational Outcomes: A Review. *Journal of Child & Adolescent Trauma*, *15*(3), 511-522. <https://doi.org/10.1007/s40653-021-00433-2>

Luthar, S. S., Suchman, N. E., & Altomare, M. (2007). Relational Psychotherapy Mothers' Group: A randomized clinical trial for substance abusing mothers. *Development and Psychopathology*, *19*(1), 243-261. <https://doi.org/10.1017/S0954579407070137>

Lutman, E., & Farmer, E. (2013). What Contributes to Outcomes for Neglected Children Who Are Reunified with Their Parents? Findings from a Five-Year Follow-Up Study. *The British Journal of Social Work*, *43*(3), 559-578. <https://doi.org/10.1093/bjsw/bcr184>

Madigan, S., Cyr, C., Eirich, R., Fearon, R. M. P., Ly, A., Rash, C., Poole, J. C., & Alink, L. R. A. (2019). Testing the cycle of maltreatment hypothesis: Meta-analytic evidence of the intergenerational transmission of child maltreatment. *Development and Psychopathology*, *31*(1), 23-51. <https://doi.org/10.1017/S0954579418001700>

Manning, V., Best, D. W., Faulkner, N., & Titherington, E. (2009). New estimates of the number of children living with substance misusing parents: results from UK national household surveys. *BMC public health*, *9*, 377-377. <https://doi.org/10.1186/1471-2458-9-377>

Manthey, J., Hassan, S. A., Carr, S., Kilian, C., Kuitunen-Paul, S., & Rehm, J. (2021). What are the Economic Costs to Society Attributable to Alcohol Use? A Systematic Review and Modelling Study. *PharmacoEconomics*, *39*(7), 809-822. <https://doi.org/10.1007/s40273-021-01031-8>

Marsden, J., Eastwood, B., Bradbury, C., Dale-Perera, A., Farrell, M., Hammond, P., Knight, J., Randhawa, K., & Wright, C. (2009). Effectiveness of community treatments for heroin and crack cocaine addiction in England: a prospective, in-treatment cohort study. *Lancet*, *374*(9697), 1262-1270. <https://doi.org/10.1016/s0140-6736(09)61420-3>

Marsden, J., Eastwood, B., Jones, H., Bradbury, C., Hickman, M., Knight, J., Randhawa, K., White, M., & National Drug Treatment Monitoring System Outcomes Study Group. (2012). Risk adjustment of heroin treatment outcomes for comparative performance assessment in England. *Addiction*, *107*(12), 2161-2172. <https://doi.org/https://doi.org/10.1111/j.1360-0443.2012.03971.x>

Mathur, M. B., Ding, P., Riddell, C. A., & VanderWeele, T. J. (2018). Web Site and R Package for Computing E-values. *Epidemiology*, *29*(5), e45-e47. <https://doi.org/10.1097/ede.0000000000000864>

Maxwell, N., Scourfield, J., Featherstone, B., Holland, S., & Tolman, R. (2012). Engaging fathers in child welfare services: a narrative review of recent research evidence. *17*, 160-169. <https://doi.org/10.1111/j.1365-2206.2012.00827.x>

McAllister, J. (2022). *The independent review of children’s social care. Final report.* Retrieved from <https://childrenssocialcare.independent-review.uk/final-report/>

McCaffrey, D. F., Griffin, B. A., Almirall, D., Slaughter, M. E., Ramchand, R., & Burgette, L. F. (2013). A tutorial on propensity score estimation for multiple treatments using generalized boosted models. *Statistics in medicine*, *32*(19), 3388-3414. <https://doi.org/10.1002/sim.5753>

McCurdy, L. Y., Yip, S. W., Worhunsky, P. D., Zhai, Z. W., Kim, S., Strathearn, L., Potenza, M. N., Mayes, L. C., & Rutherford, H. J. V. (2024). Neural correlates of altered emotional responsivity to infant stimuli in mothers who use substances. *Journal of Psychiatric Research*, *171*, 126-133. <https://doi.org/https://doi.org/10.1016/j.jpsychires.2024.01.024>

McGovern, R., Addison, M. T., Newham, J. J., Hickman, M., & Kaner, E. F. S. (2017). Effectiveness of psychosocial interventions for reducing parental substance misuse. *Cochrane Database of Systematic Reviews*(10). <https://doi.org/10.1002/14651858.CD012823>

McGovern, R., Bogowicz, P., Meader, N., Kaner, E., Alderson, H., Craig, D., Geijer-Simpson, E., Jackson, K., Muir, C., Salonen, D., Smart, D., & Newham, J. J. (2023). The association between maternal and paternal substance use and child substance use, internalizing and externalizing problems: a systematic review and meta-analysis. *Addiction*, *118*(5), 804-818. <https://doi.org/https://doi.org/10.1111/add.16127>

McGovern, R., Gilvarry, E., Addison, M., Alderson, H., Geijer-Simpson, E., Lingam, R., Smart, D., & Kaner, E. (2020). The Association Between Adverse Child Health, Psychological, Educational and Social Outcomes, and Nondependent Parental Substance: A Rapid Evidence Assessment. *Trauma Violence Abuse*, *21*(3), 470-483. <https://doi.org/10.1177/1524838018772850>

McGovern, R., Newham, J., Addison, M., Hickman, M., & Kaner, E. (2022). The effectiveness of psychosocial interventions at reducing the frequency of alcohol and drug use in parents: findings of a Cochrane Review and meta-analyses. *Addiction*, *117*(10), 2571-2582. <https://doi.org/https://doi.org/10.1111/add.15846>

McGovern, R., Newham, J. J., Addison, M. T., Hickman, M., & Kaner, E. F. S. (2021). Effectiveness of psychosocial interventions for reducing parental substance misuse. *Cochrane Database of Systematic Reviews*(3). <https://doi.org/10.1002/14651858.CD012823.pub2>

McLellan, A. T., Kushner, H., Metzger, D., Peters, R., Smith, I., Grissom, G., Pettinati, H., & Argeriou, M. (1992). The fifth edition of the addiction severity index. *Journal of Substance Abuse Treatment*, *9*(3), 199-213. <https://doi.org/https://doi.org/10.1016/0740-5472(92)90062-S>

Meier, P. S., Donmall, M. C., & McElduff, P. (2004). Characteristics of drug users who do or do not have care of their children. *Addiction*, *99*(8), 955-961. <https://doi.org/10.1111/j.1360-0443.2004.00786.x>

Mekonen, T., Chan, G. C. K., Connor, J., Hall, W., Hides, L., & Leung, J. (2021). Treatment rates for alcohol use disorders: a systematic review and meta-analysis. *Addiction*, *116*(10), 2617-2634. <https://doi.org/10.1111/add.15357>

Mellentin, A. I., Brink, M., Andersen, L., Erlangsen, A., Stenager, E., Bjerregaard, L. B., & Christiansen, E. (2016). The risk of offspring developing substance use disorders when exposed to one versus two parent(s) with alcohol use disorder: A nationwide, register-based cohort study. *J Psychiatr Res*, *80*, 52-58. <https://doi.org/10.1016/j.jpsychires.2016.06.001>

Mertens, J. R., Kline-Simon, A. H., Delucchi, K. L., Moore, C., & Weisner, C. M. (2012). Ten-year stability of remission in private alcohol and drug outpatient treatment: Non-problem users versus abstainers. *Drug Alcohol Depend*, *125*(1), 67-74. <https://doi.org/https://doi.org/10.1016/j.drugalcdep.2012.03.020>

Minozzi, S., Amato, L., Jahanfar, S., Bellisario, C., Ferri, M., & Davoli, M. (2020). Maintenance agonist treatments for opiate‐dependent pregnant women. *Cochrane Database of Systematic Reviews*(11). <https://doi.org/10.1002/14651858.CD006318.pub4>

Moore, E., & Churchill, G. (2020). Still here for children: Sharing the experiences of NSPCC staff who supported children and families during the COVID-19 pandemic. Retrieved 26/08/2024, from <https://learning.nspcc.org.uk/media/2488/still-here-for-children-sharing-experiences-nspcc-staff-during-covid-19.pdf>

Moreland, A., Newman, C., Crum, K. I., & Are, F. (2021). Types of child maltreatment and child welfare involvement among opioid-using mothers involved in substance use treatment. *Children and Youth Services Review*, *126*, 106021. <https://doi.org/https://doi.org/10.1016/j.childyouth.2021.106021>

Moreland, A. D., & McRae-Clark, A. (2018). Parenting outcomes of parenting interventions in integrated substance-use treatment programs: A systematic review. *Journal of Substance Abuse Treatment*, *89*, 52-59. <https://doi.org/10.1016/j.jsat.2018.03.005>

Morgenstern, J., Blanchard, K. A., McCrady, B. S., McVeigh, K. H., Morgan, T. J., & Pandina, R. J. (2006). Effectiveness of Intensive Case Management for Substance-Dependent Women Receiving Temporary Assistance for Needy Families. *American Journal of Public Health*, *96*(11), 2016-2023. <https://doi.org/10.2105/AJPH.2005.076380>

Murphy, A. L., Harper, W., Griffiths, A., & Joffrion, C. (2017). Family reunification: A systematic review of interventions designed to address co-occurring issues of child maltreatment and substance use [Community & Social Services 3373]. *Special Issue: Child welfare literature reviews: Literature reviews, systematic reviews and meta-analyses. How can child welfare administrators, practitioners and researchers determine what we know?*, *11*(4-5), 413-432. <https://doi.org/http://dx.doi.org/10.1080/15548732.2017.1340221>

Murphy, C. (2023). ‘Rising demand and decreasing resources’: Theorising the ‘cost of austerity’ as a barrier to social worker discretion. *Journal of Social Policy*, *52*(1), 197-214. <https://doi.org/10.1017/S0047279421000507>

Musto Wright, V. (2018). *The 2016-17 Social Return on Investment (SROI) of Adult Alcohol and Drug Interventions* <https://www.ndtms.net/VFM>

Musto Wright, V. (2021). Parents with alcohol and drug problems: investing in families workbook.

Musto Wright, V., Eastwood, B., Meier, P., & Brennan, A. (2024a). Characteristics of parents who use substances, receive specialist treatment and child welfare support in England. *Manuscript submitted for publication*.

Musto Wright, V., Eastwood, B., Meier, P., & Brennan, A. (2024b). Do parenting or child welfare support interventions improve alcohol and drug treatment completions among parents with a substance use disorder? A quasi-experimental study using generalized boosted models. *Manuscript submitted for publication*.

National Audit Office. (2007). Evaluation in government. Retrieved 15/06/2018, from <https://www.nao.org.uk/wp-content/uploads/2013/12/10331-001-Evaluation-in-government_NEW.pdf>

Neo, S. H. F., Norton, S., Kavallari, D., & Canfield, M. (2021). Integrated Treatment Programmes for Mothers with Substance Use Problems: A Systematic Review and Meta-analysis of Interventions to Prevent Out-of-home Child Placements. *Journal of Child and Family Studies*, *30*(11), 2877-2889. <https://doi.org/10.1007/s10826-021-02099-8>

Neppl, T. K., Diggs, O. N., & Cleveland, M. J. (2020). The intergenerational transmission of harsh parenting, substance use, and emotional distress: Impact on the third-generation child. *Psychol Addict Behav*, *34*(8), 852-863. <https://doi.org/10.1037/adb0000551>

NICE. (2011). *Alcohol-use disorders: Diagnosis, assessment and management of harmful drinking (high-risk drinking) and alcohol dependence. Clinical Guideline (CG115).* <https://www.nice.org.uk/guidance/cg115>

NICE. (2012a). *Drug use disorders in adults. Quality Standard (QS23).* <https://www.nice.org.uk/guidance/qs23>

NICE. (2012b). Methods for the development of NICE public health guidance (third edition). NICE process and methods [PMG4]. Retrieved 01/09/2024, from <https://www.nice.org.uk/process/pmg4/chapter/incorporating-health-economics>

NSPCC. (2020). *The impact of the coronavirus pandemic on child welfare: domestic abuse*. NSPCC. Retrieved 26/08/2024 from <https://learning.nspcc.org.uk/media/2241/impact-of-coronavirus-pandemic-on-child-welfare-domestic-abuse.pdf>

NSPCC. (2022). *Contacts to the NSPCC about drug and alcohol misuse among parents soar during the pandemic*. NSPCC. Retrieved 26/08/2024 from <https://www.nspcc.org.uk/about-us/news-opinion/2021/parents-drug-and-alcohol-misuse-raises-concerns-as-reports-to-nspcc--soars-during-the-pandemic/?utm_source=Adestra&utm_medium=email&utm_content=Contacts%20to%20the%20NSPCC%20about%20drug%20and%20alcohol%20misuse%20among%20parents%20soar%20during%20the%20pandemic&utm_campaign=20210222_KIS_CASPAR_February22>

NSPCC. (2023). Parents with substance use problems: learning from case reviews. Summary of risk factors and learning for improved practice around parents or carers with substance use problems. Retrieved 01/04/2024, from <https://learning.nspcc.org.uk/media/w2eh34r1/learning-from-case-reviews-parents-substance-use.pdf>

NTA. (2012). Parents with drug problems: How treatment helps families. In. London: National Treatment Agency for Substance Misuse.

Office of the Children's Commissioner for England. (2019). *Childhood Vulnerability in England*. Retrieved 28/03/2024 from <https://www.childrenscommissioner.gov.uk/resource/childhood-vulnerability-in-england-2019/>

Ofsted, Care Quality Commission, Her Majesty’s Prison and Probation Service, & HM Inspectorate of Constabulary and Fire & Rescue Services. (2018). Growing up neglected: a multi-agency response to older children. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/722740/Older_children_neglect_FINAL_060718.pdf>

Ohannessian, C. M. (2012). Parental Problem Drinking and Adolescent Psychosocial Adjustment: The Mediating Role of Adolescent–Parent Communication. *Journal of Research on Adolescence*, *22*(3), 498-511. <https://doi.org/https://doi.org/10.1111/j.1532-7795.2012.00791.x>

OHID. (2023a). *Annual Substance Misuse Treatment Statistics 2022-23. NDTMS Data tables.* <https://assets.publishing.service.gov.uk/media/657050863831ec000dc7496d/Adult-substance-misuse-treatment-statistics-2022-2023_data-tables.ods>

OHID. (2023b). Closed consultation. UK clinical guidelines for alcohol treatment: core elements of alcohol treatment. Retrieved 01/04/2024, from <https://www.gov.uk/government/consultations/uk-clinical-guidelines-for-alcohol-treatment/uk-clinical-guidelines-for-alcohol-treatment-core-elements-of-alcohol-treatment#pharmacological-interventions-1>

OHID. (2023c). National Drug Treatment Monitoring System (NDTMS). Reference Data (Core Dataset Q). V16.4. In: Office for Health Improvement and Disparities.

OHID. (2023d). National statistics. Adult substance misuse treatment statistics 2022 to 2023: report. Updated 21 December 2023. In: Office for Health Improvement and Disparities.

OHID. (2024). Research and analysis. Estimates of alcohol dependent adults in England: summary. In: Office for Health Improvement and Disparities.

OHID and The University of Manchester. (2024). *NDTMS - National Drug Treatment Monitoring System. Restricted section.* Office for Health Improvement and Disparities. Retrieved 01/04/2024 from <https://www.ndtms.net/>

OHID and UKHSA. (2023). Research and analysis. Estimates of opiate and crack use in England: main points and methods. In: Office for Health Improvements and Disparities.

Ondersma, S. J., Chaffin, M. J., Mullins, S. M., & LeBreton, J. M. (2005). A brief form of the child abuse potential inventory: development and validation. *34*, 301-311. <https://doi.org/10.1207/s15374424jccp3402_9>

Orford, J., Natera, G., Copello, A., Atkinson, C., Tiburcio, M., Velleman, R., Crundall, I., Mora, J., Templeton, L., & Walley, G. (2005). *Coping with Alcohol and Drug Problems: The Experiences of Family Members in Three Contrasting Cultures*. Taylor and Francis.

Osterman, R., Lewis, D., & Winhusen, T. (2017). Efficacy of motivational enhancement therapy to decrease alcohol and illicit-drug use in pregnant substance users reporting baseline alcohol use. *Journal of Substance Abuse Treatment*, *77*, 150-155. <https://doi.org/https://doi.org/10.1016/j.jsat.2017.02.003>

Page, S., Fedorowicz, S., McCormack, F., & Whitehead, S. (2024). Women, Addictions, Mental Health, Dishonesty, and Crime Stigma: Solutions to Reduce the Social Harms of Stigma. *International Journal of Environmental Research and Public Health*, *21*(1), 63. <https://www.mdpi.com/1660-4601/21/1/63>

Pajulo, M., Suchman, N., Kalland, M., & Mayes, L. (2006). Enhancing the effectiveness of residential treatment for substance abusing pregnant women and parenting women: Focus on maternal reflective functioning and mother-child relationship. *Infant mental health journal*, *27*(5), 448-448. <https://doi.org/10.1002/imhj.20100>

Park, S., & Schepp, K. G. (2015). A Systematic Review of Research on Children of Alcoholics: Their Inherent Resilience and Vulnerability. *Journal of Child and Family Studies*, *24*(5), 1222-1231. <https://doi.org/http://dx.doi.org/10.1007/s10826-014-9930-7>

Payakachat, N., Ali, M. M., & Tilford, J. M. (2015). Can The EQ-5D Detect Meaningful Change? A Systematic Review. *PharmacoEconomics*, *33*(11), 1137-1154. <https://doi.org/10.1007/s40273-015-0295-6>

Peacock, A., Eastwood, B., Jones, A., Millar, T., Horgan, P., Knight, J., Randhawa, K., White, M., & Marsden, J. (2018). Effectiveness of community psychosocial and pharmacological treatments for alcohol use disorder: A national observational cohort study in England. *Drug Alcohol Depend*, *186*, 60-67. <https://doi.org/10.1016/j.drugalcdep.2018.01.019>

Peisch, V., D. Sullivan, A., Breslend, N. L., Benoit, R., Sigmon, S. C., Forehand, G. L., Strolin-Goltzman, J., & Forehand, R. (2018). Parental Opioid Abuse: A Review of Child Outcomes, Parenting, and Parenting Interventions. *Journal of Child and Family Studies*, *27*(7), 2082-2099. <https://doi.org/10.1007/s10826-018-1061-0>

Perez-Vaisvidovsky, N., Halpern, A., Mizrahi, R., & Atalla, Z. (2023). “Fathers Are Very Important, but They Aren’t Our Contact Persons”: The Primary Contact Person Assumption and the Absence of Fathers in Social Work Interventions. *Families in Society*, *104*(3), 292-305. <https://doi.org/10.1177/10443894221145751>

Personal Social Services Research Unit. (2024). *Unit Costs of Health and Social Care programme (2022 – 2027)*. University of Kent. Retrieved 31/08/2024 from <https://www.pssru.ac.uk/unitcostsreport/>

PHE. (2019a). *National Drug Treatment Monitoring System (NDTMS). Adult drug and alcohol treatment business definitions. Core dataset O*. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785198/NDTMS_adult_drug_and_alcohol_treatment_business_definitions_CDS-O.pdf>

PHE. (2019b). *Substance misuse treatment statistics. National Drug Treatment Monitoring System: Quality and methodology information paper*. Public Health England. Retrieved 11 Dec 2020 from <https://www.ndtms.net/resources/public/NDTMS_annual_report-Quality_methodology.pdf>

PHE. (2020). *National Statistics. Adult substance misuse treatment statistics 2019 to 2020: Report*. Public Health England. Retrieved 23/04/21 from <https://www.gov.uk/government/statistics/substance-misuse-treatment-for-adults-statistics-2019-to-2020/adult-substance-misuse-treatment-statistics-2019-to-2020-report>

Public Health England. (2019). National Drug Treatment Monitoring System (NDTMS). Adult drug and alcohol treatment business definitions. Core dataset O. Retrieved 14/06/2019, from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/785198/NDTMS_adult_drug_and_alcohol_treatment_business_definitions_CDS-O.pdf>

PwC. (2018). Assessing the costs and benefits of Crisis’ plan to end homelessness.

Radcliffe, P. (2011). Motherhood, pregnancy, and the negotiation of identity: The moral career of drug treatment. *Social science & medicine*, *72*(6), 984-991.

Raitasalo, K., Østergaard, J., & Andrade, S. B. (2020). Educational attainment by children with parental alcohol problems in Denmark and Finland. *Nordic Studies on Alcohol and Drugs*, *38*(3), 227-242. <https://doi.org/10.1177/1455072520968343>

Rashti, R., Sharafi, H., Alavian, S. M., Moradi, Y., Mohamadi Bolbanabad, A., & Moradi, G. (2020). Systematic Review and Meta-Analysis of Global Prevalence of HBsAg and HIV and HCV Antibodies among People Who Inject Drugs and Female Sex Workers. *Pathogens*, *9*(6), 432. <https://www.mdpi.com/2076-0817/9/6/432>

Roscoe, S., Boyd, J., Buykx, P., Gavens, L., Pryce, R., & Meier, P. (2021). The impact of disinvestment on alcohol and drug treatment delivery and outcomes: a systematic review. *BMC public health*, *21*(1), 2140. <https://doi.org/10.1186/s12889-021-12219-0>

Rossow, I., Felix, L., Keating, P., & McCambridge, J. (2016). Parental drinking and adverse outcomes in children: A scoping review of cohort studies. *Drug Alcohol Rev*, *35*(4), 397-405. <https://doi.org/10.1111/dar.12319>

Rubenstein, B., & Stover, C. (2016). Intimate partner violence, fatherhood, and co-parenting of men in residential substance misuse treatment. Advances in Dual Diagnosis, 9 (4), 119-129. In: ADD-10-2015-0022.

Rubin, D. B. (1987). *Multiple Imputation for Nonresponse in Surveys.* John Wiley & Sons, Inc. <https://doi.org/DOI:10.1002/9780470316696>

Ryan, J. P., Marsh, J. C., Testa, M. F., & Louderman, R. (2006). Integrating Substance Abuse Treatment and Child Welfare Services: Findings from the Illinois Alcohol and Other Drug Abuse Waiver Demonstration. *Social Work Research*, *30*(2), 95-107. <https://doi.org/https://doi.org/10.1093/swr/30.2.95>

Saldana, L. (2015). An Integrated Intervention to Address the Comorbid Needs of Families Referred to Child Welfare for Substance Use Disorders and Child Neglect: FAIR Pilot Outcomes. *Child welfare*, *94*(5), 167-186.

Sampaio, F., Nystrand, C., Feldman, I., & Mihalopoulos, C. (2024). Evidence for investing in parenting interventions aiming to improve child health: a systematic review of economic evaluations. *European Child & Adolescent Psychiatry*, *33*(2), 323-355. <https://doi.org/10.1007/s00787-022-01969-w>

Schaeffer, C. M., Swenson, C. C., Tuerk, E. H., & Henggeler, S. W. (2013). Comprehensive treatment for co-occurring child maltreatment and parental substance abuse: Outcomes from a 24-month pilot study of the MST-Building Stronger Families program. *Child Abuse & Neglect*, *37*(8), 596. <https://doi.org/https://doi.org/10.1016/j.chiabu.2013.04.004>

Schölin, L., Mukherjee, R. A. S., Aiton, N., Blackburn, C., Brown, S., Flemming, K. M., Gard, P. R., Howlett, H., Plant, M., Price, A. D., Shields, J., Smith, L. A., Suttie, M., Zammitt, D. C., & Cook, P. A. (2021). Fetal alcohol spectrum disorders: an overview of current evidence and activities in the UK. *Archives of Disease in Childhood*, *106*(7), 636-640. <https://doi.org/10.1136/archdischild-2020-320435>

Schottenfeld, R. S., Moore, B., & Pantalon, M. V. (2011). Contingency management with community reinforcement approach or twelve-step facilitation drug counseling for cocaine dependent pregnant women or women with young children [Journal article]. *Drug Alcohol Depend*, *118*(1), 48‐55. <https://doi.org/10.1016/j.drugalcdep.2011.02.019>

Seay, K. D. (2020). Pathways From Parental Substance Use to Child Internalizing and Externalizing Behaviors in a Child Protective Services Sample. *Child Maltreatment*, *25*(4), 446-456. <https://doi.org/10.1177/1077559520913638>

Sherman, L. W., Gottfredson, D. C., MacKenzie, D. L., Eck, J., Reuter, P., & Bushway, S. D. (1998). Preventing Crime: What Works, What Doesn’t, What’s Promising. Retrieved 15/04/2018, from <https://www.ncjrs.gov/pdffiles/171676.pdf>

Shiba, K., & Kawahara, T. (2021). Using Propensity Scores for Causal Inference: Pitfalls and Tips. *J Epidemiol*, *31*(8), 457-463. <https://doi.org/10.2188/jea.JE20210145>

Shorter, G. W., Campbell, K. B. D., Miller, N. M., Epton, T., O’Hara, L., Millen, S., Gunnarsson, K. U., Berry, E., & Bendtsen, M. (2023). Few Interventions Support the Affected Other on Their Own: a Systematic Review of Individual Level Psychosocial Interventions to Support Those Harmed by Others’ Alcohol Use. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-023-01065-3>

Sidebotham, P., Brandon, M., Bailey, S., Belderson, P., Dodsworth, J., Garstang, J., Harrison, E., Retzer, A., & Sorensen, P. (2016a). Pathways to harm, pathways to protection: a triennial analysis of serious case reviews 2011 to 2014. Final report. Retrieved 13/06/2019, from <https://seriouscasereviews.rip.org.uk/wp-content/uploads/Triennial_Analysis_of_SCRs_2011-2014_Pathways_to_harm_and_protection_299616.pdf>

Sidebotham, P., Brandon, M., Bailey, S., Belderson, P., Dodsworth, J., Garstang, J., Harrison, E., Retzer, A., & Sorensen, P. (2016b). *Pathways to harm, pathways to protection: a triennial analysis of serious case reviews 2011 to 2014. Final report.* Retrieved from <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/533826/Triennial_Analysis_of_SCRs_2011-2014_-__Pathways_to_harm_and_protection.pdf>

Siebert, U., Alagoz, O., Bayoumi, A. M., Jahn, B., Owens, D. K., Cohen, D. J., & Kuntz, K. M. (2012). State-transition modeling: a report of the ISPOR-SMDM Modeling Good Research Practices Task Force--3. *Value Health*, *15*(6), 812-820. <https://doi.org/10.1016/j.jval.2012.06.014>

Slesnick, N., & Erdem, G. (2013). Efficacy of ecologically-based treatment with substance-abusing homeless mothers: substance use and housing outcomes [Journal article]. *Journal of Substance Abuse Treatment*, *45*(5), 416‐425. <https://doi.org/10.1016/j.jsat.2013.05.008>

Slesnick, N., Feng, X., Brakenhoff, B., & Brigham, G. S. (2014). Parenting under the influence: The effects of opioids, alcohol and cocaine on mother–child interaction. *Addictive Behaviors*, *39*(5), 897-900. <https://doi.org/https://doi.org/10.1016/j.addbeh.2014.02.003>

Slesnick, N., & Zhang, J. (2016). Family Systems Therapy for Substance-Using Mothers and Their 8- to 16-Year-Old Children. *Psychology of addictive behaviors*, *30*(6), 619-629. <https://doi.org/10.1037/adb0000199>

Smith, E. J., Lui, S., & Terplan, M. (2009). Pharmacologic Interventions for Pregnant Women Enrolled in Alcohol Treatment. *Cochrane Database of Systematic Reviews*(3). <https://doi.org/10.1002/14651858.CD007361.pub2>

Špacírová, Z., Epstein, D., García-Mochón, L., Rovira, J., Olry de Labry Lima, A., & Espín, J. (2020). A general framework for classifying costing methods for economic evaluation of health care. *The European Journal of Health Economics*, *21*(4), 529-542. <https://doi.org/10.1007/s10198-019-01157-9>

Špacírová, Z., Epstein, D., García-Mochón, L., Rovira, J., Olry de Labry Lima, A., & Espín, J. (2021). Correction to: A general framework for classifying costing methods for economic evaluation of health care. *The European Journal of Health Economics*, *22*(5), 847-847. <https://doi.org/10.1007/s10198-021-01313-0>

Staton-Tindall, M., Sprang, G., Clark, J., Walker, R., & Craig, C. D. (2013). Caregiver Substance Use and Child Outcomes: A Systematic Review. *Journal of Social Work Practice in the Addictions*, *13*(1), 6-31. <https://doi.org/10.1080/1533256X.2013.752272>

Stevens, M. (2014). The cost-effectiveness of UK parenting programmes for preventing children's behaviour problems – a review of the evidence. *Child & Family Social Work*, *19*(1), 109-118. <https://doi.org/https://doi.org/10.1111/j.1365-2206.2012.00888.x>

Stith, S., Liu, T., Davies, L., Boykin, E. L., Alder, M. C., Harris, J., Som, A., Mcpherson, M., & Dees, J. J. (2009). Risk factors in child maltreatment: A meta-analytic review of the literature. *Aggression and Violent Behavior*, *14*, 13-29. <https://doi.org/https://doi.org/10.1016/j.avb.2006.03.006>

Stover, C. S. (2015). Fathers for change for substance use and intimate partner violence: initial community pilot. *54*, 600-609. <https://doi.org/10.1111/famp.12136>

Stover, C. S., Carlson, M., Patel, S., & Manalich, R. (2018). Where's Dad? The Importance of Integrating Fatherhood and Parenting Programming into Substance Use Treatment for Men. *Child Abuse Rev*, *27*(4), 280-300. <https://doi.org/10.1002/car.2528>

Stover, C. S., McMahon, T. J., & Moore, K. (2019a). A randomized pilot trial of two parenting interventions for fathers in residential substance use disorder treatment. *104*, 116-127. <https://doi.org/10.1016/j.jsat.2019.07.003>

Stover, C. S., McMahon, T. J., & Moore, K. (2019b). A randomized pilot trial of two parenting interventions for fathers in residential substance use disorder treatment. *Journal of Substance Abuse Treatment*, *104*, 116-127. <https://doi.org/10.1016/j.jsat.2019.07.003>

Strang, J. (2015). Death matters: understanding heroin/opiate overdose risk and testing potential to prevent deaths. *Addiction*, *110*(S2), 27-35. <https://doi.org/https://doi.org/10.1111/add.12904>

Suchman, N. E., DeCoste, C., Borelli, J. L., & McMahon, T. J. (2018). Does improvement in maternal attachment representations predict greater maternal sensitivity, child attachment security and lower rates of relapse to substance use? A second test of Mothering from the Inside Out treatment mechanisms. *Journal of Substance Abuse Treatment*, *85*, 21. <https://doi.org/https://doi.org/10.1016/j.jsat.2017.11.006>

Suchman, N. E., DeCoste, C., Castiglioni, N., McMahon, T. J., Rounsaville, B., & Mayes, L. (2010). The Mothers and Toddlers Program, an attachment-based parenting intervention for substance using women: Post-treatment results from a randomized clinical pilot. *Attachment & human development*, *12*(5), 483-504. <https://doi.org/10.1080/14616734.2010.501983>

Suchman, N. E., DeCoste, C. L., McMahon, T. J., Dalton, R., Mayes, L. C., & Borelli, J. (2017). Mothering from the Inside Out: Results of a second randomized clinical trial testing a mentalization-based intervention for mothers in addiction treatment. *Development and Psychopathology*, *29*(2), 617-636. <https://doi.org/10.1017/S0954579417000220>

Svikis, D. S., Silverman, K., Haug, N. A., Stitzer, M., & Keyser-Marcus, L. (2007). Behavioral Strategies to Improve Treatment Participation and Retention by Pregnant Drug-Dependent Women. *Substance Use & Misuse*, *42*(10), 1527-1535. <https://doi.org/10.1080/10826080701212121>

Taplin, S., & Mattick, R. P. (2013). Mothers in methadone treatment and their involvement with the child protection system: A replication and extension study. *Child Abuse & Neglect*, *37*(8), 500-510. <https://doi.org/https://doi.org/10.1016/j.chiabu.2013.01.003>

Tavistock Institute of Human Relations. (2022, 26/08/2024). Life during COVID Times. <https://www.tavinstitute.org/news/life-during-covid-times/>

Tavistock Institute of Human Relations. (2023). Evaluation of the Children of Alcohol Dependent Parents programme innovation fund: full report. Independent Evaluation. Retrieved 04/04/2024, from <https://www.gov.uk/government/publications/evaluation-of-the-children-of-alcohol-dependent-parents-programme-innovation-fund/evaluation-of-the-children-of-alcohol-dependent-parents-programme-innovation-fund-full-report#conclusions-and-reflections>

Taylor, A., & Kroll, B. (2004). Working with Parental Substance Misuse: Dilemmas for Practice. *The British Journal of Social Work*, *34*(8), 1115-1132. <http://www.jstor.org/stable/23720534>

Taylor, A., Toner, P., Templeton, L., & Velleman, R. (2008). Parental Alcohol Misuse in Complex Families: The Implications for Engagement. *The British Journal of Social Work*, *38*(5), 843-864. <https://doi.org/10.1093/bjsw/bcl374>

Templeton, L. (2018). MPACT. Moving Parents and Children Together. Evaluation Report, 2006-2018. Retrieved 04/04/2024, from <https://www.actiononaddiction.org.uk/media/112/m-pact-evaluation-report-2006-18-draft-v7b.pdf?1563200966>

Thanh, N. X., Jonsson, E., Moffatt, J., Dennett, L., Chuck, A. W., & Birchard, S. (2015). An economic evaluation of the parent-child assistance program for preventing fetal alcohol spectrum disorder in Alberta, Canada. *Administration and policy in mental health*, *42*(1), 10-18. <https://doi.org/https://dx.doi.org/10.1007/s10488-014-0537-5>

The Child Safeguarding Practice Review Panel. (2021). *“The Myth of Invisible Men” Safeguarding children under 1 from non-accidental injury caused by male carers*. D. f. Education. <https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1017944/The_myth_of_invisible_men_safeguarding_children_under_1_from_non-accidental_injury_caused_by_male_carers.pdf>

The EuroQol Research, F. (2020). EQ-5D-5L: About. In. Rotterdam: The EuroQol Research Foundation.

Thompson, R. G., Alonzo, D., & Hasin, D. S. (2013). Parental Divorce, Maternal-Paternal Alcohol Problems, and Adult Offspring Lifetime Alcohol Dependence. *J Soc Work Pract Addict*, *13*(3), 295-308. <https://doi.org/10.1080/1533256x.2013.812909>

Todman, H. L. (2021). *Understanding the needs of children living with parental substance misuse: Perspectives of children and professionals* Manchester Metropolitan University].

Torvik, F. A., Rognmo, K., Ask, H., Røysamb, E., & Tambs, K. (2011). Parental alcohol use and adolescent school adjustment in the general population: Results from the HUNT study. *BMC Public Health*, *11*(1), 706. <https://doi.org/10.1186/1471-2458-11-706>

Tuithof, M., ten Have, M., van den Brink, W., Vollebergh, W., & de Graaf, R. (2014). Alcohol consumption and symptoms as predictors for relapse of DSM-5 alcohol use disorder. *Drug Alcohol Depend*, *140*, 85-91. <https://doi.org/https://doi.org/10.1016/j.drugalcdep.2014.03.035>

Tuten, M., Svikis, D. S., Keyser-Marcus, L., O’Grady, K. E., & Jones, H. E. (2012). Lessons Learned from a Randomized Trial of Fixed and Escalating Contingency Management Schedules in Opioid-Dependent Pregnant Women. *The American Journal of Drug and Alcohol Abuse*, *38*(4), 286-292. <https://doi.org/10.3109/00952990.2011.643977>

UKATT Research Team. (2005a). Cost effectiveness of treatment for alcohol problems: findings of the randomised UK alcohol treatment trial (UKATT). *BMJ*, *331*(7516), 544. <https://doi.org/10.1136/bmj.331.7516.544>

UKATT Research Team. (2005b). Effectiveness of treatment for alcohol problems: findings of the randomised UK alcohol treatment trial (UKATT). *BMJ*, *331*(7516), 541. <https://doi.org/10.1136/bmj.331.7516.541>

UNODC. (2023). Special Points of Interest. World Drug Report 2023. In: United Nations Office on Drugs and Crime.

VanderWeele, T. J., & Ding, P. (2017). Sensitivity Analysis in Observational Research: Introducing the E-Value. *Annals of Internal Medicine*, *167*(4), 268-274. <https://doi.org/https://www.acpjournals.org/doi/10.7326/M16-2607>

Velleman, R., & Orford, J. (2001). *Risk and resilience: adults who were the children of problem drinkers*. Routledge. <https://doi.org/https://doi.org/10.4324/9780203727690>

Velleman, R., & Templeton, L. (2007). Understanding and modifying the impact of parents’ substance misuse on children. *Advances in Psychiatric Treatment*, *13*(2), 79-89. <https://doi.org/10.1192/apt.bp.106.002386>

Velleman, R., & Templeton, L. J. (2016). Impact of parents' substance misuse on children: an update. *BJPsych Advances*, *22*(2), 108-117. <https://doi.org/10.1192/apt.bp.114.014449>

von Hippel, P. T. (2018). How Many Imputations Do You Need? A Two-stage Calculation Using a Quadratic Rule. *Sociological Methods & Research*, *49*(3), 699-718. <https://doi.org/10.1177/0049124117747303>

Welsh, J.-A., Precey, G., & Lambert, P. (2008). Parents of children at risk—a multi-agency initiative to address substance misuse amongst parents whose children are at risk of neglect. *Child Abuse Review*, *17*(6), 454-462. <https://doi.org/10.1002/car.1050>

Whittaker, A., Elliott, L., Taylor, J., Dawe, S., Harnett, P., Stoddart, A., Littlewood, P., Robertson, R., Farquharson, B., & Strachan, H. (2022). The Parents under Pressure parenting programme for families with fathers receiving treatment for opioid dependence: the PuP4Dads feasibility study. *10*, 3. <https://doi.org/10.3310/YOWK7214>

Whittaker, A., Martin, F., Olsen, A., & Wincup, E. (2020). Governing Parental Drug Use in the UK: What’s Hidden in “Hidden Harm?”. *Contemporary Drug Problems*, *47*(3), 170-187. <https://doi.org/10.1177/0091450920941267>

WHO. (2016). *Child maltreatment. Factsheet*. Retrieved 15/05/2019 from <https://www.who.int/en/news-room/fact-sheets/detail/child-maltreatment>

WHO. (2020). *Archived: WHO Timeline - COVID-19*. World Health Organization. Retrieved 26/08/2024 from <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>

Willey, H., Eastwood, B., Gee, I. L., & Marsden, J. (2016). Is treatment for alcohol use disorder associated with reductions in criminal offending? A national data linkage cohort study in England. *Drug Alcohol Depend*, *161*, 67-76. <https://doi.org/https://doi.org/10.1016/j.drugalcdep.2016.01.020>

Windle, M., & Windle, R. C. (2018). Parental divorce and family history of alcohol disorder: Associations with young adults’ alcohol problems, marijuana use, and interpersonal relations. *Alcoholism: Clinical and Experimental Research*, *42*(6), 1084-1095. <https://doi.org/10.1111/acer.13638>

Winhusen, T., Kropp, F., Babcock, D., Hague, D., Erickson, S. J., Renz, C., Rau, L., Lewis, D., Leimberger, J., & Somoza, E. (2008). Motivational enhancement therapy to improve treatment utilization and outcome in pregnant substance users. *Journal of Substance Abuse Treatment*, *35*(2), 161-173. <https://doi.org/10.1016/j.jsat.2007.09.006>

Winklbaur-Hausknost, B., Jagsch, R., Graf-Rohrmeister, K., Unger, A., Baewert, A., Langer, M., Thau, K., & Fischer, G. (2013). Lessons learned from a comparison of evidence-based research in pregnant opioid-dependent women. *Human psychopharmacology*, *28*(1), 15-24. <https://doi.org/10.1002/hup.2275>

Worcel, S. D., Furrer, C. J., Green, B. L., Burrus, S. W. M., & Finigan, M. W. (2008). Effects of family treatment drug courts on substance abuse and child welfare outcomes. *Child Abuse Review*, *17*(6), 427-443. <https://doi.org/doi:10.1002/car.1045>

Wye, L., Brangan, E., Cameron, A., Gabbay, J., Klein, J. H., & Pope, C. (2015). Evidence based policy making and the ‘art’ of commissioning – how English healthcare commissioners access and use information and academic research in ‘real life’ decision-making: an empirical qualitative study [journal article]. *BMC Health Services Research*, *15*(1), 430. <https://doi.org/10.1186/s12913-015-1091-x>

Xu, X., Yonkers, K. A., & Ruger, J. P. (2017). Economic evaluation of a behavioral intervention versus brief advice for substance use treatment in pregnant women: results from a randomized controlled trial. *BMC pregnancy and childbirth*, *17*(1), 83. <https://doi.org/https://dx.doi.org/10.1186/s12884-017-1260-5>

Yonkers, K. A., Forray, A., Howell, H. B., Gotman, N., Kershaw, T., Rounsaville, B. J., & Carroll, K. M. (2012). Motivational enhancement therapy coupled with cognitive behavioral therapy versus brief advice: a randomized trial for treatment of hazardous substance use in pregnancy and after delivery. *General Hospital Psychiatry*, *34*(5), 439-449. <https://doi.org/10.1016/j.genhosppsych.2012.06.002>

Zeller, D., Hornby, H., & Ferguson, A. (2007). Evaluation of Maine's Family Treatment Drug Courts: A Preliminary Analysis of Short and Long-Term Outcomes. In. Portland, ME: Hornby Zeller Associates.

Ziglio, E. (2017). Strengthening resilience: a priority shared by Health 2020 and the Sustainable Development Goals. Retrieved 14/06/2019, from <http://www.euro.who.int/__data/assets/pdf_file/0005/351284/resilience-report-20171004-h1635.pdf>

# Appendix A Studies included in literature review submitted for confirmation review July 2019 (updated)

## Introduction

The aim of the review submitted for confirmation review was to identify effective and cost-effective interventions for parents with SUD that would be applicable to England, thus providing context to my research which evaluates existing service provision. Thus, the following research questions shaped the review:

1. Which interventions for parents with SUD are likely to be effective in England?
2. Which interventions for parents with SUD are likely to be cost-effective in England?

Interventions were deemed to be effective if they resulted in reductions in parental substance use or abstinence. Secondary outcomes, such as reductions in child abuse potential were also considered. This chapter presents the method for the review, the results of the main literature search and a summary of findings.

## Methods

### Search and eligibility criteria

An initial scoping review of the literature, including other reviews with similar research questions and aims (Galvani & Forrester, 2011; McGovern et al., 2017; Murphy et al., 2017), helped determine the search terms and parameters used. The full Ovid MEDLINE search strategy for the systematic review is presented in *Search strategy*. The electronic databases of Ovid MEDLINE, PsycINFO and ASSIA were also searched.

Language of publications was restricted to English. Papers were published from January 2004 to June 2019, and for this thesis has since been updated to include studies published up to March 2024. This window for study inclusion was judged to be long enough to capture as many studies as possible given the dearth of studies in this area, while capturing data relevant to the current context. Papers which only reported pharmacotherapy for substance-exposed neonates and interventions for children using alcohol or drugs were excluded unless the intervention clearly also aimed to address parental SUD.

### Quality assessment

There are various tools that can be used to assess the quality of research design and evidence reported in a study. UK guidance for government analysts is to use the Maryland Scale of Scientific Methods (Sherman et al., 1998) when assessing the robustness of evaluation design (HM Treasury and Evaluation Task Force, 2011). As this thesis is intended to evaluate current government interventions to address parental SUD and provide policymakers (and practitioners) with recommendations on how best to support families, the Maryland Scale was used to assess strength of design followed by an assessment of other quality criteria. There are five levels within the Maryland Scale to evaluate the internal validity of research studies, with level one being the weakest and level five the strongest (see Table A‑1). An approach similar to the Grading of Recommendations Assessment, Development and Evaluation (GRADE) (Guyatt et al., 2010; Guyatt et al., 2008) was used, albeit far less stringent one, where evidence based on random allocation may begin at Maryland level 5 – very high confidence in results – but may be downgraded because of clear study limitations that decreases confidence generalisability e.g. small sample size, high level of drop out between follow-ups or suboptimal analytic strategy. Conversely, a level 2 intervention group compared with unmatched group study design may be upgraded to a higher level of confidence if adequate control of confounding variables were employed.

According to the authors of the Maryland scale, only levels three and above are considered to be robust enough study designs to be able to attribute outcomes to an intervention (Sherman et al., 1998), yet typically systematic reviews include only studies which would be assessed as level four and five. Given the paucity of the effectiveness and cost-effectiveness evidence it was decided that a similar approach to Galvani and Forrester (2011) in their rapid evidence assessment of social work and recovery from substance use would be taken, with any study graded level two or above included for an initial assessment.

*Table A‑1 Summary table of the Maryland Scale of Scientific Methods, adapted from Campbell and Harper (2012); Galvani and Forrester (2011); National Audit Office (2007); Sherman et al. (1998)*

| Maryland Scale | Confidence of effect | Description | Detail |
| --- | --- | --- | --- |
| Level 1 | Very low | Predicted compared with actual; No comparison group | Outcomes assessed only for those receiving the intervention at a single point in time, thereby providing a weak counterfactual estimate. Such studies provide a very low level of confidence in attributing any changes observed to the intervention. E.g. a survey conducted only at the end of treatment to measure alcohol consumption levels. |
| Level 2 | Low | Intervention compared with unmatched | Outcomes observed before and after an intervention with the inclusion of an unmatched comparison group or site, or there is no strong evidence that the intervention and comparison group have historically moved analogously to allow a quasi-experimental, level 3 design. Collectively these increase the risk of differences between the intervention and comparison group to be the results of statistical ‘noise’. E.g. a pre-post treatment evaluation of alcohol consumption levels in an urban area compared with an inner city area. |
| Level 3 | Moderate | Quasi-experimental design: strong difference-in-difference design | Before and after outcomes for an intervention and comparison group. There should be robust evidence that the groups have moved in parallel during the time of the study. E.g. a pre-post evaluation of alcohol consumption levels among service users commencing treatment in April 2017 in two inner London boroughs – one borough with the intervention, the other without – observed over the same time frame. |
| Level 4 | High | Quasi-experimental design: intervention group compared with a well-matched counterfactual | Before and after outcomes for an intervention and comparison group matched on pertinent outcome-related factors using statistical techniques, e.g. a pre-post treatment evaluation of alcohol consumption levels in two inner London boroughs where the comparison group is selected using propensity score matching to ensure fair comparisons and control for variables that might bias results. Done correctly, differences between the two groups can only be attributed to the intervention. |
| Level 5 | Very high | Random allocation/ experimental design | Individuals/ groups are assigned to either the intervention or control group and their outcomes observed, e.g. a randomised control trial. Further research studies are very unlikely to change our confidence in reported effectiveness. |

## Results

### Characteristics of studies

The original search produced 1,652 records (see Figure A‑1). Additional records were found through searches of the British Journal of Social Work and Social Care Online, as well as backward and forward citation searching on papers included in the study. Duplicates were subsequently removed, and 1,502 papers were initially screened. 121 studies were assessed for eligibility and a total of 51 studies analysed. Reasons for exclusion from the review during assessment for eligibility included studies being judged low or very low using the criteria specified above (n=41), parental SUD outcomes not being reported (n=7) or not being relevant to the research questions (n=22).

*Figure A‑1 Review PRISMA diagram*

Records after duplicates removed  
(n = 1,502)

Additional records identified through other sources  
(n = 46)

Records identified through database searching  
(n = 1,652)

Records screened  
(n = 1,502)

Records excluded  
(n = 1,381)

Full-text articles excluded,

(very low-quality n = 41;

Parent outcome not reported n=7; not relevant to research question n=22)

Full-text articles assessed for eligibility  
(n = 121)

Studies included   
(n = 51)

After reviewing the literature, three clear intervention options were identified for families experiencing parental SUD: 1) specialist treatment for parents with SUD 2) specialist treatment for parents with SUD plus a parenting intervention and 3) specialist treatment for SUD plus statutory child welfare, including parenting interventions. Results for these will be presented in turn.

#### Specialist treatment

Specialist treatment for parents with SUD addresses the clinical and social needs of the parent and so may plausibly also impact on children of parents receiving the intervention. Outcomes typically focus on treatment retention and treatment completion measured using administrative datasets and reductions in substance use measured by urinalysis and/or validated questionnaires such as the Addiction Severity Index (McLellan et al., 1992). Fourteen papers on specialist treatment were included in the review. All studies focused on pregnant women, except for Schottenfeld et al. (2011) who examined effectiveness of interventions for both pregnant women and mothers with cocaine use disorder, and Slesnick and Erdem (2013) who examined effectiveness of interventions for homeless mothers with SUD. As Tables A-2 and A-3 show, most of the studies on treatment were in the moderate quality and almost all were from the US. No study achieved a quality rating of 5 (very high) owing mainly to generalisability concerns from small sample sizes, insufficient follow-up periods or studies occurring only on one site.

*Table A‑2 Overview of studies on specialist treatment (n=14)*

|  |  |  |  |
| --- | --- | --- | --- |
| Quality rating | Intervention | Outcomes | Additional comments |
| 2 (Low) | Pharmacological (n=2), | Pharmacological treatment may be effective for pregnant women.  Inconclusive results on MET and RBT. CM may be effective for pregnant women and ICM for cocaine using women postpartum. | 0 UK studies (13 US and 1 Austrian).  Most studies were of pregnant women. The body of evidence is too small to be confident in the interpretation of results.  No cost-effectiveness papers were found. |
| 3 (Moderate) | Pharmacological (n=2), Motivational enhancement therapy (MET, n=2), contingency management (CM, n=1), reinforcement-therapies (RBT, n=2), intensive case management (ICM, n=1), RBT and CM (n=1) |
| 4 (High) | MET (n=2), CM (n=1). |

*Table A‑3 Data extracts of studies on specialist treatment (n=14)*

|  |  |
| --- | --- |
| Reference | Fischer et al. (2006) |
| Aims | To evaluate the effectiveness and safety of methadone compared with buprenorphine treatment in opioid‐dependent pregnant women on treatment retention, drug use and neonatal abstinence syndrome (NAS). |
| Design | RCT, flexible‐dosing comparison study. Hospital clinical data was analysed. The severity and duration of NAS was measured using the Finnegan Scale, the severity of parental dependence was measured using the ASI. |
| Population | 18 women were assigned randomly to methadone (n=9) or buprenorphine (n=9) at weeks 24–29 gestation. |
| Intervention | MAT in the form of opioid substation therapy provided by hospital pharmacy. Participants were admitted to a clinic for at least three days when starting the trial to receive 24‐hour monitoring and care. Gynaecological examinations occurred on day 1, then again at weeks 28, 32, 36 and 38 of gestation, and finally at delivery. Postpartum, participants were investigated for congenital problems. Neonates were observed for at least 10 days in the hospital. |
| Country | Austria (Vienna). |
| Outcomes | The buprenorphine group were more likely to be retained in treatment, but the methadone group were significantly more likely to reduce their use of opioids on top of what they were prescribed (p=0.047). 43% of neonates did not need treatment for NAS. However, new-borns in the methadone group began to exhibit NAS symptoms earlier than the buprenorphine group (mean = 60 hours vs. 72 hours after last medication). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Jansson et al. (2005) |
| Aims | To analyse the effectiveness of ICM compared with regular care management for postpartum drug dependent women on treatment retention and abstinence. |
| Design | RCT, with four-month postpartum follow-up of women giving birth in a community hospital between March and November 1998. Data came from medical records and patient questionnaires. |
| Population | Intervention (n=22) and comparison (n=34) mothers who had engaged with a comprehensive drug treatment service and were dependent on opioids and/or cocaine. |
| Intervention | Both treatment arms engaged with the comprehensive drug treatment programme which provided transport, child care and various support services to drug-dependent mothers in a single location. The comparison group were scheduled routine paediatric care at 2 weeks, a month, two months and four months postpartum. The intervention group received the same plus fortnightly care management via phone or face to face (at the treatment service or at home). |
| Country | USA (a community hospital in East Baltimore). |
| Outcomes | In both the intervention and comparison group, the frequency of case management visits was positively correlated with treatment retention, however mothers who received ICM stayed in treatment significantly longer on average (mean) (45 vs. 32 days, p < .013). There was no significant difference in likely drop out rates or methadone maintenance between the two groups at final four-month follow-up. Mothers assigned to the comparison group had a significantly higher likelihood of testing positive for cocaine in urine analysis than those assigned to ICM (17% vs. 0%, p < .05). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Jones et al. (2005) |
| Aims | To compare effectiveness of methadone and buprenorphine on neonatal abstinence syndrome (NAS) outcomes. |
| Design | RCT, double-blind, double-dummy, flexible dosing, parallel-group |
| Population | Buprenorphine prescribed pregnant women (n=10) and methadone prescribed pregnant women (n=11). |
| Intervention | Methadone and buprenorphine, plus contingency management. |
| Country | USA |
| Outcomes | Results suggest that buprenorphine and methadone are comparable in terms of neonatal outcomes. The buprenorphine group were more likely to be retained in treatment, the methadone group were significantly more likely to reduce their illicit (i.e. non-prescribed) opioid use. |
| Cost-benefit/ cost-effectiveness | n/a. |
| Overall quality rating | Low. |
| Reference | Jones et al. (2011) |
| Aims | To evaluate the effectiveness of Reinforcement-Based Treatment (RBT) in addition to usual care on treatment, maternal delivery and neonatal outcomes among pregnant women misusing opioids and/ or cocaine. |
| Design | RCT comparing TAU with TAU enhanced with RBT. All mothers had completed a week long inpatient stay on an assisted living unit, and were prepared to live in recovery or other drug-free housing. Outcomes were measured 1-month after being randomised and again after giving birth using standardised validated instruments and administrative datasets. |
| Population | Intervention (n=47) and comparison (n=42). |
| Intervention | RBT is an intensive behavioural intervention, with sessions two to three time a week, integrating behavioural techniques (positive reinforcement and social learning) with motivational interviewing, tailored treatment plans and care management. |
| Country | USA. |
| Outcomes | Intervention mothers were significantly more likely to spend longer in treatment (average 33 days, p < .001) and six times longer in recovery housing than the comparison group. There were no statistical differences in the likelihood of testing positive for illicit substance. There was no significant difference observed in neonatal outcomes between the two groups, with the exception of length of stay in hospital after birth with intervention neonates spending 1.3 fewer days than comparison new-borns (X2 (1) = 4.7, p=.03). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Lander et al. (2015) |
| Aims | To evaluate the relative effectiveness of pregnancy-only and mixed-gender therapy groups (TAU) on outcomes for pregnant women receiving mono-buprenorphine. |
| Design | RCT, with four-week postpartum follow-up reliant on self-reported data. |
| Population | Intervention (n=27) and comparison (n=18) women who presented to an opioid treatment service between six and 30 weeks gestation. |
| Intervention | The TAU group therapy comprised CBT, learning of the disease model of addiction, relapse prevention skills, and 12-step facilitation. The intervention group included the above as well as buprenorphine and group therapy in a pregnancy-only group and focused discussions on pregnancy- and birth-related topics. Both groups had to attend NA or AA. |
| Country | USA. |
| Outcomes | There were no significant observed differences in relapse rates, treatment retention or other outcomes. Both groups were comparably satisfied with their experiences, however the intervention group rated topic relevance during therapy sessions significantly better than the comparison group. Neonatal abstinence syndrome was observed in 23% of cases, however there was no significant difference between groups. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Schottenfeld et al. (2011) |
| Aims | To evaluate the effectiveness of various interventions for cocaine using pregnant women/mothers. |
| Design | RCT, 2X2 design. 12 months follow-up. |
| Population | Participants were 145 cocaine dependent women who were either pregnant (*n* = 64) or had custody of a child (*n* = 81). 36 were assigned to community reinforcement and contingency management, 35 were assigned to community reinforcement and voucher control, 37 were assigned to twelve‐step facilitation and contingency management and 37 assigned to twelve‐step facilitation and voucher control. |
| Intervention | See population. community reinforcement approach (CRA) incorporates components of CBT and uses structured behavioural techniques. |
| Country | USA (unspecified urban area). |
| Outcomes | CM was associated with significantly greater cocaine abstinence (p<.01), negative urinalysis (p<0.01), and higher proportion of documented abstinence across follow-up assessments (p<0.05), compared to VC. The differences between CRA and TSF were not significant. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Slesnick and Erdem (2013) |
| Aims | To test the effectiveness of an ecologically-based treatment compared with usual care for homeless women with SUD and young children (aged 2-6 years old) in their care. |
| Design | RCT, 3, 6, and 9 months post-baseline follow ups. |
| Population | Intervention (n=30) and comparison (n=30) groups |
| Intervention | The intervention group received community reinforcement approach therapy, as well as 3 months of help with rent and utility bills and care management. The comparison group received housing and services through the family shelter and community housing programs. |
| Country | USA (unspecified location). |
| Outcomes | Intervention mothers showed a quicker reduction in alcohol use and increase in housing stability. However, by 9 months there were no significant differences. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Svikis et al. (2007) |
| Aims | To analyse the effectiveness of an escalating voucher incentive scheme on treatment engagement and retention among opioid and/or cocaine dependent pregnant women in residential treatment compared with TAU. |
| Design | Randomised allocation with two-week follow-up. |
| Population | Intervention (n=49) and comparison (n=42) |
| Intervention | CM: The escalating voucher incentive scheme incentive women modestly at first ($5 for day 1) and increasing by $5 each consecutive day of attendance up to day 14. Women receiving the intervention were explicitly told that could earn $525 in vouchers which could be spent in an on-site shop or local community. TAU was a comprehensive treatment programme including seven days of residential treatment and a subsequent month of intensive outpatient care. |
| Country | USA (Baltimore, Maryland). |
| Outcomes | Vouchers incentives did not decrease rates of early dropout, however there was an improved engagement and retention during the transition to outpatient treatment. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Tuten et al. (2012) |
| Aims | To evaluate the relative effectiveness of an escalating reinforcement condition, a fixed reinforcement condition and TAU on abstinence and treatment retention. |
| Design | RCT. ASI interviews were conducted at baseline and urine toxicology data was analysed thereafter. |
| Population | Pregnant women receiving methadone maintenance in an escalating condition (n=52), fixed condition (n=38) and TAU (n=43) group. |
| Intervention | Two standard ways of delivering contingency management (CM) are fixed (static financial amount $25) and escalating reinforcement voucher schemes. In the study, escalating reinforcement group received $7.50 for their first drug-free test and could potentially receive £1,364 by the end of the intervention. |
| Country | USA (Baltimore, Maryland). |
| Outcomes | The pooled escalating and fixed reinforcement conditions received a greater total amount of voucher money than the comparison group average (M=392.40 [SE=40.47] vs. 219.74 [SE=39.78] respectively, p< .001). The escalating and fixed conditions did not differ on abstinence and retention. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | High. |
| Reference | Winhusen et al. (2008); Osterman et al. (2017) |
| Aims | To evaluate the effectiveness of motivational enhancement therapy for pregnant substance users (MET-PS) compared with TAU. |
| Design | The 2008 study was a randomised, parallel trial with allocation to either three sessions of MET-PS or TAU and with one- and three-month follow-up data. Data analyses included treatment clinic records, qualitative urine toxicology measures, and self-reports. The 2017 study analysed data for the 41 alcohol using women in the sample. |
| Population | Intervention (n=102 and 27 in 2008 and 2017 respectively) and comparison (n=98 and 14) pregnant women. |
| Intervention | Manualised MET-PS is a form of MET specifically for pregnant women misusing AOD. In addition to usual MI and MET techniques the 1-2 hour sessions promoted healthy pregnancies and actively encouraged engagement with other available treatment services. |
| Country | USA (North Carolina, New Mexico, Indiana and Kentucky). |
| Outcomes | The 2008 study showed no significant different between the intervention and comparison group in terms of treatment attendance and substance use in the first month of treatment. The 2017 study, on the other hand, which focused on alcohol using pregnant women only found MET to have significantly better results in terms of illicit drug use days at baseline (X*2*=6.89, df=1, p <.01) and at follow-up, and for alcohol use at follow-up (X*2*=13.07, df=1, p <.001). All other outcomes were non-significant. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | High. |
| Reference | Winklbaur-Hausknost et al. (2013) |
| Aims | To identify lessons learned from methadone vs buprenorphine trials for pregnant women with opioid use disorder. |
| Design | 2 double-blind, double-dummy RCTs compared. In both studies, participants also received contingency management. |
| Population | Pilot study (PS ,n= 18) and MOTHER-trial (MT, n=41) |
| Intervention | Methadone vs buprenorphine |
| Country | USA, Canada and Austria |
| Outcomes | Nonsignificant differences in dropout rates were found (22% in PS versus 10% in MT), but dropout was significantly earlier in the MT. Significantly higher rates of illicit drug use in the PS compared with the MT (p<0.001), however, there were no significant differences in neonatal data. |
| Cost-benefit/ cost-effectiveness | n/a |
| Overall quality rating | Moderate. |
| Reference | Yonkers et al. (2012); Xu et al. (2017) |
| Aims | To analyse the effectiveness and cost-effectiveness of motivational enhancement therapy plus cognitive behavioural therapy (MET-CBT) compared with brief advice delivered in a hospital outpatient setting (reproductive health clinics) on substance use during pregnancy and three-month postpartum. |
| Design | The 2012 study was a parallel RCT, with a three-month postpartum follow-up; the 2017 was an economic evaluation using the previous study data. |
| Population | Intervention (n=82) and comparison (n=86) women fewer than 28 weeks pregnant. |
| Intervention | Obstetric clinicians provided brief advice (1 minute); research nurse therapists provided 30 minute MET-CBT adapted from existing manuals that was delivered on the same day as outpatient visits. The sessions focused on motivational enhancement, the causes and consequences of behaviour (functional analysis), safe sex, relapse prevention and problem-solving skills. |
| Country | USA (New Haven and Bridgeport, Connecticut). |
| Outcomes | There were notable substance use reductions in both the intervention and comparison groups. There were no significant differences in the self-reported proportion of substance-misusing days prior to and 3 months postpartum, which was corroborated by urine toxicology and breath tests. The intervention group appeared to be of lower risk of preterm birth, however this was not a significant finding (p=.08). |
| Cost-benefit/ cost-effectiveness | Costs were compared using Wilcoxon rank sum tests. The intervention was more costly than than the comparison (median = $1,297 per person vs. $303 per person, p< 0.01), outcomes costs were comparable (all p values ≥ 0.55). Overall costs of care were not statistically different (median total cost = $26,993 per intervention person vs. $27,831 per comparison person, p = 0.90). |
| Overall quality rating | Moderate. |

#### Specialist treatment plus a parenting intervention

Specialist treatment for parents with SUD plus a parenting intervention addresses the above as well as parenting and relational skills aiming to improve outcomes for parents, as well as their children. Improvements in parenting capacity are typically measured through validated questionnaires such as the Brief form of the Child Abuse Potential (BCAP) Inventory (Ondersma et al., 2005).As Tables A-4 and A-5 below show, 14 studies were included on the effectiveness of treatment plus parenting interventions (excluding those with an integrated statutory child welfare support, which is covered in the next section). Studies were in the low- to high-quality range and almost all were from the US. All studies focused on mothers only except Lam et al. (2009) and Stover et al. (2019b) in which only fathers were treated, and Barlow et al. (2019) in which both mothers and fathers could participate in the programme. Two cost-effectiveness studies, including one from the UK, were included in the review, both of which were high quality (Barlow et al., 2019; Thanh et al., 2015). No study achieved a quality rating of 5 (very high) owing mainly to generalisability concerns from small sample sizes, insufficient follow-up periods or studies occurring only on one site.

*Table A‑4 Overview of studies on specialist treatment plus parenting intervention studies (n=14)*

|  |  |  |  |
| --- | --- | --- | --- |
| Quality rating | Intervention | Outcomes | Additional comments |
| 2 (Low) | Relational therapy (n=1),  attachment-based (n=1), home-visitations (n=1) | Relational therapy may be effective in the short term, but favourable outcomes may not be sustained.  Attachment-based programmes are feasible and appear to be effective.  Home visitation interventions may be both effective and cost-effective. | All studies US based except 1 Australian, 1 Finnish, 1 Canadian and 1 UK study. 2 studies on fathers, 1 study on mothers and fathers. 2 CEA.  Large-scale trials are needed to better understand effectiveness. |
| 3 (Moderate) | Relational therapy (n=4), attachment-based therapy (n=3), home-visitations (n=2) |
| 4 (High) | Home-visitations (n=2) |

*Table A‑5 Data extracts of studies on specialist treatment plus parenting interventions (n=14)*

|  |  |
| --- | --- |
| Reference | Barlow et al. (2019) |
| Aims | To analyse the effectiveness and cost-effectiveness on child abuse potential of the Parents under Pressure (PuP) programme compared with treatment as usual for primary caregivers of children younger than 2.5 years, receiving treatment for dependence on psychoactive substances. |
| Design | Mixed methods design, randomised control trial study across seven sites. Data was collected at baseline, start of intervention and 6-month follow-up. Child abuse potential was gauged using the 24-item Risk Abuse Scale from the Brief Child Abuse Potential Inventory (BCAP). A within-trial economic evaluation was conducted from the NHS and personal social services perspective. The EQ-5D-5L was administered to estimate quality-adjusted life years (QALYs). |
| Population | Intervention (n=52) and comparison (n=48) groups. Almost all participants were mothers (n=4 fathers). |
| Intervention | PuP is a 24-week home visiting intervention for parents of children under the age of 2.5 with multiple problems receiving treatment for their dependency on psychoactive substances. The programme comprises 12 modules relating to parenting and coping skills lasting 1-2 hours which are determined according to familial need, delivered within a case management structure. Outside of these hours, case managers provide further support on other pertinent issues such as housing. |
| Country | UK (seven anonymous sites). |
| Outcomes | Primary caregivers receiving the intervention significantly improved their BCAP score over time, in comparison to the comparison group whose scores deteriorated. While no difference was observed between the two arms on parenting stress, negative relationships or self-harm, the intervention group were statistically more likely to improve in several emotion-management, wellbeing and depression measures. There were no differences observed in the parents reporting of their child’s social and emotional wellbeing or in child functioning. There was a trend observed in an increase of legal proceedings (referred to by the researchers as ‘high’ safeguarding risk) in the comparison group and no change in intervention group, however, these were not statistically significant findings. |
| Cost-benefit/ cost-effectiveness | BCAP scores and QALYs were used to calculate the incremental cost-effectiveness ratios (ICERs). The intervention had a 52% probability of cost-effectiveness at a willingness to pay (WTP) of £1,000 per unit BCAP score improvement, increasing to 98% at a WTP of £20,000. However, the intervention was above the NICE threshold of £20-30,000 per QALY gain at £34,095. |
| Overall quality rating | High. |
| Reference | Bartu et al. (2006) |
| Aims | To investigate the effect on breastfeeding, immunisation and parental drug use. The hypothesis was that the outcomes of the home‐visiting group (HVG) would be superior to the control group (CG). |
| Design | RCT - patients were randomised postpartum – with six-month follow-up an intention-to-treat analysis. |
| Population | Intervention (n=76) and comparison (n=76) pregnant illicit drug using women at 35-40 weeks gestation. |
| Intervention | The intervention group received eight home visits providing parenting skills and information on breastfeeding and child development whereas the comparison had telephone contact at two months and a home visit at six months. |
| Country | Australia (Perth, Western Australia). |
| Outcomes | The study had sufficient power but generally did not find statistical differences. Both groups demonstrated reduced drug use during pregnancy and an increase by six months. The intervention group was 7% more likely to be retained (93% vs.CG 86%). Immunisation rates were similar for each group. Median breastfeeding duration for intervention group was eight weeks (95% CI, 3.8–12.2) compared with ten weeks for the comparison group (95% CI, 7.3–12.7). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Belt et al. (2012) |
| Aims | To evaluate the effectiveness of a psychodynamic mother–infant group psychotherapy (PGT) for perinatal women with a drug use disorder. |
| Design | Pre-treatment, 4 and 12 months’ follow-up assessments, including use of the Emotional Availability Scales (EA). |
| Population | Intervention (n=26) and comparison (n=25) as well as 50 dyads in a non-drug-using comparison group. |
| Intervention | PGT: 20 to 24 weekly 3-hr sessions with 3 to 5 months of follow-up. Comparison: tailored psychosocial support lasting a year on average. |
| Country | Finland |
| Parental outcomes | Maternal hostility decreased signiﬁcantly in the intervention group. Intrusiveness decreased in both, but particularly in the PTG group. Both interventions showed an increase in dyad quality and success in maternal abstinence, treatment retention, and alleviating depressive symptoms. |
| Cost-benefit/ cost-effectiveness | n/a |
| Overall quality rating | Low |
| Reference | Dawe et al. (2017) |
| Aims | To analyse the effectiveness of Parents under Pressure (PuP) for parents in methadone treatment on reducing child abuse and neglect. |
| Design | RCT. Assessments were conducted at baseline and at three and six month follow-ups using validated instruments. Multilevel linear mixed (MLM) modeling was used to compare average trajectories. |
| Population | Intervention (n=22), brief intervention (n=23) and TAU (n=19) groups. Participants were all receiving methadone to treat opioid dependency and had a least one child aged 2-8 years living with them. |
| Intervention | PuP - see above. |
| Country | Australia (two inner-city sites in Brisbane). |
| Outcomes | PuP parents demonstrated significant improvements across several family functioning areas: parenting stress (z = 2.199, p<.001), child abuse potential (z = 4.591, p<.001), parenting rigidity (z = 2.30, p<.001), methadone dose (z = 2.355, p<.001), and child behaviour problems (z = 2.750, p< .001). The brief intervention group saw a reduction in child abuse potential only. Child abuse potential increased among the TAU group. 36% maintained their high risk status. PuP children demonstrated a significant increase in child prosocial scores (z = 2.51, p<.001). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Grant et al. (2005) |
| Aims | To evaluate the effectiveness of the Parent-Child Assistance Programme (P-CAP) for drug and alcohol misusing women |
| Design | Pretest-posttest comparison across three sites: the original demonstration (OD), Seattle replication (SR) and Tacoma replication (TR). Data was collected using a standardised instrument – the Addiction Severity Index (ASI) – with additional questions. |
| Population | N=216: OD n=60, SR = 76, n = 80. |
| Intervention | P-CAP is a three-year home visitation intervention for women who have delivered at least one substance-exposed baby, that begins either at pregnancy or postpartum. Case managers are paraprofessionals supporting women to receive substance-misuse treatment and access to relevant community agencies such as mental health providers and employment support services. Case managers typically work with 15 families. |
| Country | USA (three sites in Washington state). |
| Outcomes | In the original demonstration, the intervention group performed signiﬁcantly better than the comparison. This was pattern was maintained in relation to contraception use and future births or improved in relation to treatment completion and abstinence at the replication sites. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Gwadz et al. (2008) |
| Aims | To evaluate the effectiveness of Family First on problem drinking among HIV and non-HIV infected mothers compared with a single session of social/ motivational intervention. |
| Design | RCT, 18 months study. |
| Population | Intervention (n= 57) and comparison (n=61) groups. |
| Intervention | Family First, a form of CBT comprising 14-sessions lasting 90 minutes each on substance use/ problem drinking and parenting behaviour and skills. |
| Country | USA (New York). |
| Outcomes | All mothers reduced alcohol and drug, however there were no significant differences by the end of the reporting period between the intervention and comparison group. |
| Cost-benefit/ cost-effectiveness | n/a |
| Overall quality rating | Moderate. |
| Reference | Lam et al. (2009) |
| Aims | To analyse the effectiveness of Parent Skills with Behavioural Couples Therapy (PSBCT) for alcohol dependent fathers in an outpatient treatment setting on reducing paternal substance misuse and improving parenting skills. |
| Design | Randomised clinical before and after outcomes pilot study. Standardised instruments were used to measure changes in substance use, domestic violence, general parenting and child maltreatment. Interviews were held at baseline, post-treatment, and at 6- and 12-month follow-ups. Analysis was primarily conducted using growth curve modelling. |
| Population | Fathers (n=30), their female partners and children aged 8-12 years old. Female partners had to be abstinent for the couple to be included in the study. |
| Intervention | The intervention group received PSBCT, others regular behavioural couples therapy (BCT) and a third group were randomly allocated to individual-base treatment (i.e. standard treatment for alcohol dependency). All participants attended 24 sessions: cognitive-behavioural therapy for the first 12 weeks, the randomised condition thereafter. |
| Country | USA. |
| Outcomes | Minimal differences were observed between PSBCT and BCT on substance use, dyadic adjustment, and intimate partner violence, however effect sizes for PSBCT compared with BCT was larger in relation to parenting and child welfare involvement at 6 and 12 months. Both arms were significantly more effective than IBT. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Luthar et al. (2007) |
| Aims | To evaluate the effectiveness of the Relational Psychotherapy Mother’s Group (RPMG) with recovery training (RT) for mothers with SUD in methadone clinics. |
| Design | RCT, intention to treat, with 6-month post treatment follow-up (12 months post baseline). Self-reported child maltreatment was measured using questionnaires and urinalysis was conducted to assess cocaine and opiate use. |
| Population | Intervention (n=60) and comparison (n=67) |
| Intervention | In addition to regular methadone treatment, RMPG participants received 24 weekly group sessions, half of which focused on parenting. RT mothers received group counselling focusing on dependency and recovery. |
| Country | USA (New Haven, Connecticut). |
| Outcomes | At the end of treatment, RPMG was marginally effective in terms of child maltreatment and cocaine abuse. Children of mothers in the intervention arm reported significantly greater outcomes of emotional adjustment and depression. At 6 months follow-up, however, treatment gains were no longer apparent. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Slesnick and Zhang (2016) |
| Aims | To evaluate the effectiveness of family systems therapy or women’s health education for mothers with SUD. |
| Design | Self-report and observational data were collected. 18 month follow-up. |
| Population | Intervention (home based, n=62), intervention (office based, n=61), comparison (n=60). |
| Intervention | Ecologically-based family therapy (EBFT): 12 session family therapy, including cognitive behavioural techniques targeting parent-child dyads and family support needs and problem-solving skills. |
| Country | USA. |
| Outcomes | Mothers assigned to EBFT showed a quicker reduction in self-reported substance use. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Stover et al. (2019b) |
| Aims | To compare two fatherhood and focused interventions in residential treatment programmes. |
| Design | Participants were assessed prior to treatment, at the end of treatment, following completion of the intervention booster sessions, and 3 months post intervention. |
| Population | Fathers for change (n=33) and Dads n Kids (n = 29). |
| Intervention | Fathers for Change (F4C) is an integrated intervention targeting intimate partner violence and child maltreatment. Dads ‘n’ Kids (DNK) is a psychoeducational intervention focused on child development and behavioural parenting skills. |
| Country | USA. |
| Outcomes | Both interventions showed decreases in intimate partner violence. F4C showed some benefit over DNK regarding affect dysregulation symptoms and substance use relapse. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Suchman et al. (2010); Suchman et al. (2017); Suchman et al. (2018) |
| Aims | To evaluate the effectiveness of the Mothers and Toddlers Programme (MTP) also referred to as Mothering from the Inside Out (MIO) compared with Parent Education (PE) for mothers in outpatient treatment on parenting. |
| Design | Randomised clinical trial. Primary outcomes were reflective functioning (RF) and maternal accounts of the child. Secondary outcomes included caregiving, child communication during dyadic exchanges, maternal distress and relapse. During the study, mothers who were on course to complete the 12 MTP sessions but needed more time were offered 12 more. Differences observed in outcomes between those who received 12 or 24 sessions were negligible and so data were merged and analysed together. Data was gathered using a combination of structured, semi-structured interviews and standardised instruments. |
| Population | Intervention (n=23) and comparison (n=24) groups in the first RCT (Suchman et al., 2010); intervention (n=40) and comparison (n=47) groups in the later studies (Suchman et al., 2018; Suchman et al., 2017). |
| Intervention | All participants received usual treatment for substance misuse in addition to either MIO or PE. MIO comprised 12 weekly one-hour sessions in an outpatient substance misuse treatment facility of parenting therapy. Its aim is to improve reﬂective functioning (RF) and mental parenting representations. PE comprised weekly one-hour ICM sessions and leaflets on parenting. |
| Country | USA (New Haven, Connecticut). |
| Outcomes | At 6-week follow-up, as the sample was not large enough to provide sufficient power to identify statistical differences, effect sizes were calculated using estimated means and pooled standard deviations; medium effects where the effect size was greater than .20 were deemed substantial. MIO mothers demonstrated more improvement most of the primary and secondary outcomes noted above post-treatment and follow-up. There was no improvement in child-focused RF suggesting that while improvement in recognising simple emotions was made, mothers in both trial groups had limited capacity to grasp how filial emotions affect behaviour and the dyadic relationship. Post-treatment psychiatric distress findings were mixed: MTP participants reported fewer symptoms at the end of treatment, while at follow-up PE participants reported less depression, albeit not less distress (Suchman et al., 2010). At 12-month follow up, MIO mothers demonstrated significantly greater compassion and dyadic alignment. As addiction severity increased, MIO appeared to be a protective factor for RF, dyadic interactions, and child attachment, albeit not all differences were statistically significant (Suchman et al., 2017). MIO intervention fidelity was generally associated with improvements in RF and caregiving (Suchman et al., 2018). MTP children communicated more frequently with and responding less contingently to their mothers than PE children. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Thanh et al. (2015) |
| Aims | To evaluate the cost-effectiveness of the Parent-Child Assistance Programme (P-CAP) on preventing foetal alcohol spectrum disorder (FASD). |
| Design | A decision analytic model estimating both the incremental cost–effectiveness ratio (ICER) and the net monetary beneﬁt (NMB) of the P-CAP. In the CEA the incremental cost was per prevented case, while in the CBA, prevented cases were monetised using a discounted incremental lifetime FASD cost of $800,000. A societal perspective and a time horizon of 3 years was adopted. The counterfactual scenario modelled was P-CAP not existing. Costs were discounted at 5%. |
| Population | N=366. |
| Intervention | See Grant et al., 2005 above. |
| Country | Canada (25 programmes in Alberta Province). |
| Outcomes | The intervention was estimated to prevent 31 (20-43) FASD cases. |
| Cost-benefit/ cost-effectiveness | ICER = $97,000 ($72,000-$153,000) and NMB = $22m ($13m-$31m). |
| Overall quality rating | High. |

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#### Specialist treatment plus statutory child welfare support, including parenting interventions

Specialist treatment plus statutory child welfare support, including parenting interventions typically offered a combination of treatment, child social work and legal support to extremely vulnerable families whose children have been removed from their primary caregivers or are at risk of being put into care. Outcomes centred on familial reunification, no further maltreatment related to parental substance use and/or pladversement in a safe permanent home (‘permanency’), which may be achieved away from the familial home if it were in the best interest of the child. Twenty three studies were in the low- to high-quality range Tables A-6 and A-7. All were from the US except one Welsh (Forrester et al., 2008; Forrester et al., 2014) and one English study (Harwin et al., 2018; Harwin et al., 2016; Harwin et al., 2014). Five economic evaluations were included the review (Burrus et al., 2011; Forrester et al., 2008; Harwin et al., 2014; Ryan et al., 2006; Zeller et al., 2007). No study achieved a quality rating of 5 (very high) again owing mainly to generalisability concerns from small sample sizes, insufficient follow-up periods or studies occurring only on one site.

*Table A‑6 Overview of studies on specialist treatment plus statutory child welfare (n=23)*

|  |  |  |  |
| --- | --- | --- | --- |
| Quality rating | Intervention | Outcomes | Additional comments |
| 2 (Low) | With a parenting intervention (n=4), without a parenting intervention (n=2), Family Treatment Drug Court (FTDC) (n=3) | Parenting interventions for those involved with statutory child welfare may be effective and cost-effective.  FTDCs have moderate quality evidence supporting entry into treatment, but not for retention, completion, abstinence or permanency. | One Welsh and One English based study. 5 economic analyses of low-high quality. |
| 3 (Moderate) | With a parenting intervention (n=1), without a parenting intervention (n=4)  FTDC (n=8) |
| 4 (High) | Without a parenting intervention (n=3). |

*Table A‑7 Data extracts of studies on specialist treatment plus statutory child welfare interventions (n=23)*

|  |  |
| --- | --- |
| Reference | Akin et al. (2017) |
| Aims | To analyse the effectiveness of the Strengthening Families Programme (SFP) – a parenting intervention for parents with substance use disorder whose children are in foster care - on re-entry into foster care. |
| Design | Quasi-experimental, longitudinal study with five years follow-up post reunification. Propensity score matching was used to create a well-matched counterfactual, while survival analyses were used to analyse intervention effectiveness. |
| Population | Intervention (n=219) and comparison (n=274) children previously reunified with their parents. |
| Intervention | SFP. Children in the comparison group received usual care management provided by social care services. |
| Country | USA (10 sites in a mid-Western state). |
| Outcomes | There was no statistical difference in reunification between the intervention (23.7%) and comparison (18.6%) group. The multivariate Cox regression model, showed that, while controlling for a range of characteristics, significant predictors of reentry were removal due to child behaviour (HR = 2.09, p = .019), poverty (HR = 2.49, p < .001), and reunification between 15 and 18 months (compared with reunification in <15 months; HR =1.95, p = .022). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | High. |
| Reference | Barth et al. (2006) |
| Aims | To explore the relationship between parental treatment for clinical dependency on drugs and/or alcohol and recurrence of child maltreatment and abuse. |
| Design | Quasi-experimental study design, using propensity score matching to create a comparison group with a similar propensity for treatment and account for bias, with 18 month follow-up. Data from the National Survey of Child and Adolescent Wellbeing (NSCAW) – a longitudinal study of child maltreatment and neglect – was analysed. Included participants were children living at home with female primary care givers with a treatment need. |
| Population | Intervention (n=219) and comparison group (n=219). |
| Intervention | Variety of treatment interventions. |
| Country | USA (covering 36 states). |
| Outcomes | After-matching, by the end of the 18-month study period, 19.3% of caregivers that received treatment had a repeat child abuse report versus 8.6% of caregivers not in treatment. Thus, children whose caregivers were in treatment were more likely to have a child maltreatment rereport than those who declined treatment. The intervention group were significantly more likely to experience a recurrence of child abuse being reported to welfare services than the comparison group (19.3% vs. 8.6%). Mental health problems among caregivers (HR = 1.75, p <.05) and previous involvement with child welfare services (HR = 1.80, p<.05) were significantly associated with the hazard ratio. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Boles et al. (2007) |
| Aims | To present 24 month reunification rates following FTDC interventions in Sacramento. |
| Design | Quasi-experimental, 24 months follow-up. Linkage of Child Protective Services, Alcohol and Drug Services, and court administrative data systems. Comparison group derived of families known to services in the six months prior to the establishment of the parallel FTDC. Parental demographics and baseline characteristics were controlled for in the analysis. |
| Population | Intervention (573 parents and 861 children) and Comparison (111 parents and 173 children). |
| Intervention | Parallel FTDC. |
| Country | USA (Sacramento, California). |
| Outcomes | Parents on the programme were more likely to enter treatment; however they spent significantly fewer days in treatment (F(1, 539) = 5.0, p < .05). No differences in the likelihood of completing treatment were observed. Children on the programme were more likely to reunify (OR = 1.38, CI = 1.14, 1.68, p = 0.001). No difference was observed in the time to reunification, possibly because of the high rate of homelessness between both groups. Heroin-using parents had the lowest rates of reunification with their children at 24 months (33.3%) while marijuana users had the highest (45.4%). No differences in probability of re-entering foster care |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Brown et al. (2021) |
| Aims | To evaluate the feasibility of a pilot mindfulness intervention for parents with SID involved with statutory child welfare services. |
| Design | Intention to treat RCT. |
| Population | Intervention (n=11) and comparison (n=10). |
| Intervention | The intervention was delivered at home to parents in six weekly lasting approximately 1 h each. Parents received psychoeducational content and parenting training. TAU involved care management activities. All wait-list control group families received weekly-to-monthly visits at home as well as other care management support. |
| Country | USA (unspecified). |
| Outcomes | Intervention participants experienced decreases in parenting stress (p < 0.05, Cohen’s d = 0.98), child abuse potential (p < 0.05, Cohen’s d = 1.03), and child behaviour problems (p < 0.001, Cohen’s d = 3.28), as well as increases in mindfulness awareness (p < 0.01, Cohen’s d = 1.37) and non-judgment (p < 0.05, Cohen’s d = 1.21) compared to the control group. |
| Cost-benefit/ cost-effectiveness | n/a |
| Overall quality rating | Low |
| Reference | Bruns et al. (2012) |
| Aims | To examine the outcomes of participants in an FTDC, as compared to participants in the regular dependency court within the same jurisdiction. |
| Design | Quasi-experimental study, using propensity score matching to adjust for differences between groups. Follow-up window: 1-3 years. Data were obtained from the Superior court, FTDC, children’s social care and substance misuse treatment administrative databases. |
| Population | Intervention (n=76) and Comparison (n=76). |
| Intervention | Integrated FTDC, plus wraparound care. |
| Country | USA (King County, Washington). |
| Outcomes | FTDC parents were 1.5 times more likely than non-FTDC parents to be admitted to substance use treatment (84% vs. 57%, X2 (1) = 12.79, p < .01) and they entered treatment quicker (median 36 vs. 120 days, log-rank X2 = 10.9, p < .01). FTDC parents were more likely than non-FTDC parents to receive treatment (116 mean treatment events [SD = 97] vs. 51 events [SD = 57], albeit both distributions were highly skewed (Mann-Whitney U = 694, p < .01).  FTDC parents remained in treatment longer, (log rank X2 = 3.7, ns, Breslow X2 = 5.4, ns, Tarone-Ware X2 = 5.0, ns), and were 1.3 times more likely to successfully complete treatment (72% vs. 54%, X2 (2) = 6.4, ns), however findings were not significant. FTDC children spent less time in care (median 718 vs. 813 days, log rank X2 = 4.2, ns) returned home more quickly (median 476 vs. 689 days, log rank X2 = 4.6, ns) and were more likely to achieve permanency (61% vs. 43%, X2 = 4.5, ns). However, these outcomes were not statistically significant. FTDC children were 1.9 times more likely to be returned home (“returned to custody, on trial home visit, or reunified”; 55% vs. 29%, X2 (1) = 9.1, p < .05). FTDC families were about half as likely as comparison families to have a subsequent child welfare investigation, however numbers were very small and results were not significant. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Burrus et al. (2011) |
| Aims | To examine the costs and effects of FTDC on treatment and child welfare outcomes. |
| Design | Quasi-experimental using an administrative data extraction tool used in previous studies. |
| Population | Intervention (n=200) and Comparison (n=200). |
| Intervention | Integrated FTDC. |
| Country | USA (Baltimore City, Maryland). |
| Outcomes | Parents on the programme entered treatment sooner (57 vs 88 days (F(1, 233) = -4.72, p < .01) and were retained for longer (138 vs 82 days) (F(1, 233) = 6.84, p < .01). Of parents who entered treatment, 64% of those on the programme completed compared with 36% parents not on the programme (X2 (1) = 5.8, p < .01). Children whose parents were on the programme spent significantly less time in foster care: 252 vs. 346 days (F(1, 303) = 14, p < .00). Of cases that did reach permanency, the non-programme cases did so faster (249 vs. 325 days) (F(1, 116) = 7.19, p < .01).There were significantly more family reunifications in the families on the programme: 70% vs 45%. (X2 (1) = 9.49, p = .000). |
| Cost-benefit/ cost-effectiveness | Net savings of $5,478 per family. |
| Overall quality rating | Moderate. |
| Reference | Chuang et al. (2012) |
| Aims | To examine whether caregiver participation in an integrated FTDC positively impacted three child welfare outcomes: reunification, time to permanency, and re-entry into care. |
| Design | Quasi-experimental study. Comparison group taken from child welfare administrative data comprising similar families in a neighbouring county similar to the intervention site, using propensity score matching to adjust for differences between groups. Follow-up of two years. |
| Population | Intervention (n=95) and Comparison (n=424). |
| Intervention | Integrated FTDC, plus group counselling, parent and vocational programmes. Parents received 9-12 months of intensive outpatient treatment and were required to attend weekly AA/NA meetings. |
| Country | USA (Hillsborough County, Florida). |
| Parental outcomes | Children on the programme were more likely to be reunified (53% vs. 42%) and less likely to re-enter care within 12 months of permanency (2% vs 12%). However, families on the programme took longer to achieve permanency: 495 days (s.d. 300) vs. 395 days (s.d. 208). All observed differences were statistically significant (p<.05). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Dakof et al. (2010) |
| Aims | To examine the effectiveness of the Engaging Moms Program (EMP) compared with ICM on outcomes for mothers registered with an FTDC. |
| Design | RCT, intention-to-treat study. Mothers were assessed at intake, then at 3, 6, 12, and 18 months thereafter. Child welfare outcomes extracted from the court administrative data, other outcomes were measured via face-to-face interviews and use of standard instruments such as the Addiction Severity Index (ASI). |
| Population | Intervention (n=31) and Comparison (n=31). |
| Intervention | EMP treatment in an FTDC. EMP is based on multidimensional family therapy. Counsellors conduct sessions with mothers and families focusing on the mother’s motivation to change, emotional attachment, relationships, parenting, problem solving and communication skills. |
| Country | USA (Miami, Florida). |
| Outcomes | Mothers in the EMP were more likely to graduate from FTDC: 73% vs 38% (X2 (1) = 9.43, p = 0.002). Children whose mothers were in EMP were more likely to be reunified 15 months after engaging than mothers assigned to ICM: 70% vs 40% (X2 (2) = 7.59, ns)’ |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Dauber et al. (2012) and Morgenstern et al. (2006) |
| Aims | To analyse the effectiveness of ICM compared with treatment as usual among female care givers receiving Temporary Assistance for Needy Families (TANF), including effectiveness on child welfare outcomes not directly targeted. |
| Design | Random assignment to ICM or treatment as usual; four-year follow-up. Case managers for both groups were addiction counsellors with either a Bachelors or Masters degree. Caregivers were interviewed at recruitment stage and at 3,9,15 and 24 month follow-up stages. Child welfare administrative datasets were also used to identify children for the study and to measure their outcomes four years after the intervention. |
| Population | Intervention (n=161) and comparison (n=141) groups. |
| Intervention | Weekly ICM sessions up to 12 months focusing on treatment and employment, then tapered sessions up to 24 months. As the intervention did not directly target child welfare outcomes, it did not include coordination with child welfare services. Treatment as usual was defined as appropriate referrals made by a clinical care coordinator. Failure to attend treatment was followed by phone calls and letters. |
| Country | USA (Essex County, New Jersey). |
| Outcomes | ICM clients were significantly more likely to start, engage with and remain in treatment compared with the comparison group. Moreover, intervention clients were almost twice as likely to be abstinent at the 15 month follow-up (P<.0025).  In general, the study found little effect of treatment on child welfare outcomes. There was a small but significant effect of ICM care giver abstinence compared with the comparison group, with longer periods of abstinence among the intervention group being associated with a lower probability of child protection recidivism (OR=.88, 95% CI=.79–.98, p<.05). In contrast, longer abstinence was related to an increased probability for the comparison group, albeit this finding was not statistically significant. Child protection incidents and care placements rates significantly reduced over time (OR=.82, 95% CI=.71–.95, p<.010 and OR=.77, 95% CI=.65–.90, p<.01) for both arms. ICM had an initial impact on child placements during the first year of the study with a lower proportion of children in care compared with the comparison group, however this reduced over time. This could be explained by the fact that ICM intervention was designed to be most intensive in the first year, with a tapered contact thereafter. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | High. |
| Reference | Donohue et al. (2014) |
| Aims | To evaluate the effectiveness of a family-based therapy for mothers referred from child welfare services for child neglect and treatment for SUD. |
| Design | RCT, intention to treat. Assessments at baseline, 6 and 10 month follow-ups. Sessions included adult family members. The Child Abuse Potential Inventory (CAPI) was used to estimate child maltreatment potential among mothers in the study. Substance use was measured using the Timeline Follow-Back (TLFB) and urinalysis. A secondary outcomes measure of risk of HIV transmission was also included in the study, as measured by the Total Risk Scale of the Risk Assessment Battery (RAB). |
| Population | Intervention (n=35) and comparison (n=37) groups. |
| Intervention | Family-based therapy. Sessions took place in homes, lasted 6 months, and comprised 20 sessions. Several elements were incorporated into the therapy sessions in addition to substance use and parenting skills, such as financial management. Treatment as usual referred to services usually made by child welfare services. |
| Country | USA (unspecified county). |
| Outcomes | Mothers in both groups decreased their drug use and child neglect potential. FBT outperformed according to secondary outcomes. FBT Mothers who were referred for neglect but not child exposure to drug use demonstrated better outcomes in child maltreatment potential than both TAU and FBT mothers who were referred because of neglect and child exposure to drug use. Similar results occurred for ‘hard’ drug use. |
| Cost-benefit/ cost-effectiveness | n/a |
| Overall quality rating | Moderate. |
| Reference | Forrester et al. (2008) and Forrester et al. (2014) |
| Aims | To quantitatively and qualitatively analyse the impact of an Intensive Family Preservation Service (a.k.a. ‘Option 2’) targeting parental substance misusers whose children are at risk of being placed into care. |
| Design | The 2008 study was a mixed method study design: a quasi-experimental quantitative component, with an average of 3.5 years follow-up (ranging from eight months to 6.5 years) and interviews with eight families (11 parents and seven children). The 2014 paper had an average of 5.6 years follow-up and interviews with 15 intervention families (46 children) and12 comparison families (28 children) |
| Population | Intervention (n=279) and comparison (n=89) children in the quantitative analyses. |
| Intervention | An intensive four-week home-based intervention. Workers are paraprofessionals incorporating motivational interviewing (MI) techniques, are on call 24/7 and work with one family at a time. |
| Country | UK (Wales). |
| Outcomes | Among the intervention families who had not fully engaged with the programme two notable reasons were highlighted by the parents: fear of having their child taken away or how disclosure would affect their children, and being too under the influence of substances to properly engage with the programme. Albeit this represents data from a very small sample. Criticisms related to the short duration of the programme which was tied to relapse and mental health problems post-intervention. Another common criticism was that the service was not timely enough – parents wished they could have accessed it earlier to prevent subsequent problems for them and their children. The likelihood of entering care was the same for both the intervention and comparison groups (about 40%), however children receiving the intervention took longer to enter care and spent significantly fewer days in care. At follow-up intervention children were 12% more likely to be at home than comparison children (68% vs. 56% respectively, p=0.04). The 2014 study suggests that the intervention had a beneficial impact on family functioning; there were no signs that children who remained at home were at risk. |
| Cost-benefit/ cost-effectiveness | Intervention costs = £2,195 per child, net savings were £1,178. BCR=1.54. |
| Overall quality rating | Moderate. |
| Reference | Green et al. (2007) |
| Aims | To examine the effectiveness of FTDC and the different types of parental treatment experienced by those on the programme on both treatment and child welfare outcomes. |
| Design | Quasi-experimental, two-year follow-up, matching administrative data from child protection services, the courts and birth records. |
| Population | Intervention (n= 250, including 50 high intensity treatment service recruits) and Comparison (n=200) |
| Intervention | FTDC. |
| Country | USA (4 sites across the country). |
| Outcomes | Parents on the programme entered treatment sooner (73 vs. 182 days), were retained for longer (303 vs. 185 days) and were more likely to complete treatment (45% vs. 34%). FTDC was also significantly effective when parents in both the intervention and comparison group had similar treatment experiences. Children on the programme were placed more quickly in permanent living situations (360 vs. 435 days) and were more likely to be reunified (57% vs. 44%). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Harwin et al. (2016); Harwin et al. (2014); Harwin et al. (2018) |
| Aims | To determine the longer-term impact of the Families Drug and Alcohol Court (FDAC) to inform discussions on the wider roll-out and future investment. |
| Design | Quasi-experimental, one-year and five-year follow-up periods. Administrative data from children’s services, Cafcass and intervention records. Comparison group were taken from another three inner-London jurisdictions. |
| Population | Intervention group (n=140, n=139 at end of proceedings and n=138 at follow-up) and Comparison group (n=100 at baseline, n=98 at end of proceedings and n=98 at follow-up). |
| Intervention | Integrated FTDC. |
| Country | England (one court covering three London boroughs: Islington, Camden and Westminster) |
| Outcomes | FDAC mothers were significantly more likely to stop misusing substances (46% vs. 30%) and when compared with mothers who were reunified with their children, FDAC mothers were significantly more likely to sustain their recovery during the five-year follow-up period. An estimated quarter of all reunified mothers, including FDAC mothers, experienced domestic violence/ mental health issues during the five-year follow-up period. |
| Cost-benefit/ cost-effectiveness | The average cost of the FDAC team per family was £8,740 over the life of the case. This cost was offset by savings to local authorities from more children remaining with or returning to their families. Further FDAC was associated with shorter care placements (£4,000 saving per child) and court hearings, as well as less need for legal representation at each hearing (£682 saving per family), and fewer contested cases. Moreover, the FDAC team undertook work equivalent to that of experts in non-FDAC care cases, saving £1,200 per case. |
| Overall quality rating | Moderate (Harwin et al. 2014 = low). |
| Reference | Huebner et al. (2012) |
| Aims | To examine the effectiveness of The Sobriety Treatment and Recovery Teams (START) programme. |
| Design | Quasi-experimental, pre-test-post-test. Measures included the Continuous Quality Assessment (CQA) and three datasets: START Information Network (START-IN), investigation, and OOHC (out-of-home care). |
| Population | 322 Families (531 Adults and 451 Children) |
| Intervention | START partners child welfare workers with treatment providers. START workers receive substance use and motivational interviewing training, and have a relatively small caseload. |
| Country | USA (four sites) |
| Outcomes | Mothers were almost twice as likely to become abstinent following completion, and children were placed in care at half the rate than expected. Fathers were far less likely to achieve abstinence than mothers. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Ryan et al. (2006) |
| Aims | To analyse the effectiveness ICM in the form of recovery coaches for substance-abusing and dependent mothers in the child welfare service. |
| Design | Randomised assignment to intervention (treatment as usual plus recovery coach) and control (treatment as usual) group with one year (Ryan et al., 2006). All families were had children in care and parents were defined as abusing or dependent on substances according to DSM-IV guidelines and referred to treatment by a juvenile court assessment programme. Children included in the study were at least 12 years old. Juvenile justice, child welfare and treatment administrative datasets were used. |
| Population | Intervention (n=317) and comparison (n=136); intervention (n=521) and comparison (n=217) family groups; intervention (n=2362) and comparison (n=1078) respectively. |
| Intervention | ICM in the form of recovery coaches working with treatment and child welfare services. |
| Country | USA (Chicago and Cook County, Illinois). |
| Outcomes | Douglas-Siegel and Ryan (2013): Children in the intervention group were significantly less likely to experience a subsequent arrest than those in the comparison group (9% vs. 19%, p<.05), with the arrest hazard decreasing by 52% for those in the intervention group (β = −.72; p < .01; SE = .27; Exp(β) = .49). Furthermore, children whose mothers were primary alcohol users were significantly less likely to be arrested that those whose mothers were cocaine and heroin users. Being an older youth and male were significant predictors of arrest, as was a deficit in parental skills judged by case workers. The odds of reunification were 1.28 times greater for intervention families (X2(1) = 5.87, p<.05). Older children were significantly more likely to be reunified with their families, while unemployed households and families facing legal problems were significantly less likely to be reunified. |
| Cost-benefit/ cost-effectiveness | $59,000 cost saving. However, the authors have not conducted a full economic evaluation. |
| Overall quality rating | High. |
| Reference | Saldana (2015) |
| Aims | To evaluate the effectiveness of the Family Actively Improving Relationships (FAIR) on concurrent parental substance misuse and child neglect. |
| Design | RCT pilot. Assessments using validated instruments (Addiction Severity Index and The Brief Child Abuse Potential Inventory) and the Service Utilization Survey (SUS) were conducted at baseline, 6 months, and 12 months. As the size was small and there was great variation in presentation, the researchers used paired t-tests to evaluate outcomes. |
| Population | Intervention (n=18) and comparison TAU (n=31) mothers all of whom had been referred to statutory child welfare services and whose children were are at home or in the process of being reunified. |
| Intervention | Eight-month treatment programme comprising Parent Management Training (PMT) and the Reinforcement Base Treatment. Counsellors and child welfare services are in regular contact to ensure coordinated treatment plans. Positive behaviours are reinforced with voucher incentives. Parent skills training and practical parenting coaching are provided. |
| Country | USA. |
| Outcomes | Intervention mothers were more likely to engage and complete treatment than those in the comparison and saw significant improvements in parenting, substance misuse and mental health and auxiliary needs. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Schaeffer et al. (2013) |
| Aims | To evaluate the effectiveness of the Multisystemic Therapy-Building Stronger Families (MST-BSF) pilot home-based study compared with comprehensive community treatment on subsequent maltreatment and reunification. |
| Design | Quasi-experimental study, 24 month follow-up, pre-post intervention design. |
| Population | Intervention (n=25) and comparison (n=18) mother-children dyads. |
| Intervention | MST-BSF is designed to address parental substance misuse and child welfare needs. The model is derived from three other models with their own evidence base 1) standard MST deigned to support young people involved in the youth offending system, 2) MST for child abuse and neglect (MST-CAN) and 3) Reinforcement-Based Treatment  (RBT) for adult substance abuse. |
| Country | USA (New Britain, Connecticut) |
| Outcomes | Children whose mothers received comprehensive community treatment were significantly more likely to experience a substantiated and unsubstantiated maltreatment report than intervention families with large and medium effect sizes, respectively. Intervention children were two times less likely to experience an incident of subsequent abuse by any caregiver, however this was not statistically significant. Intervention children did experience significantly fewer incidences of abuse. Intervention children spent significantly fewer days in out-of-home placements. |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Low. |
| Reference | Worcel et al. (2008) |
| Aims | To examine treatment and child welfare outcomes in three FTDCs. |
| Design | National evaluation using a quasi-experimental design and a 24 month follow-up. |
| Population | Intervention (n=301) and Comparison (n=919). |
| Intervention | Various FTDC types. |
| Country | USA (3 jurisdictions). |
| Outcomes | Mothers on the programme were more likely to enter treatment (odds were improved by a factor of 3.2, (X2 (1) = 24.40, p < .01) and more likely to enter treatment sooner: (F(1,684) = 14.04, p < .01) with a rate of treatment entry approximately double that of parents not on the programme. Mothers were also retained for longer in treatment (F(1,1216) = 180.59, p < .01) and more likely to complete treatment (X2 (1) = 65.59, p < .01). Being on the programme accounted for 13% of the variation in days spent in treatment and 12% in completing at least one treatment episode. OR of completing treatment = 3.8. No difference in the likelihood of being in care placement, (X2 (1) = 0.80, ns), however children on the programme spent less time in care (F(1,940.89) = 34.72, p < .01). Time to permanency was not significantly different between the two groups (X2 (1) = 0.73, ns.) Families on the programme were significantly more likely to be reunified (X2 (1) = 5.59, p < .05). |
| Cost-benefit/ cost-effectiveness | N/A. |
| Overall quality rating | Moderate. |
| Reference | Zeller et al. (2007) |
| Aims | To determine the effectiveness of family drug courts in Maine compared with traditional court settings in helping substance-misusing parents achieve better parent-child outcomes. |
| Design | Intervention vs. unmatched comparison groups. Analysed data from FTCS in Maine and compared outcomes with three court jurisdictions without an FTDC, which were selected because the caseload and demography of the populations were similar to those of FTDC jurisdictions in Maine. Another comparison group consisted of substance misusing parents who were processed in the FTDC areas in the two years prior to FTDC being established. Data were obtained from reviewing FTDC case files and analysing the children’s social care administrative database. |
| Population | Intervention (n=49), non-FTDC in three comparison jurisdictions (n=38) and pre-FTDC in Maine (n=55). |
| Intervention | Integrated FTDC. |
| Country | USA (Maine). |
| Outcomes | FTDC parents were significantly more likely to enter into treatment (70.0%) than the non-FTDC in three comparison jurisdictions (33.3%) and were more likely to complete treatment successfully (55.0% vs. 29%). Parents who completed treatment were five times more likely to reunify than parents who did not. FTDC children experience significantly fewer placement changes (2.9) than the non-FTDC in three comparison jurisdictions (4.0) and non-significant fewer changes than the pre-FTDC children in Maine (3.1). FTDC children were significantly more likely to have been placed in a relative foster care setting (54.7%) than the pre-FTDC children in Maine (33.1%). In addition. FTDC children were significantly more likely to have experienced placement in a traditional foster care setting (41.9%). FTDC children had far fewer subsequent removals than non-FTDC in other areas (32.6% vs. 53.9%) as well as pre-FTDC in Maine (50.7%). However, these differences were not significant. Despite success in the programme being low, FTDC children still achieved better adoption outcomes. Children of FTDC parents who terminated their parental rights in court were more likely to go on to adoption in comparison with the non-FTDC in other jurisdictions and the pre-FTDC implementation group (13.5%, 2.3% and 1.6% respectively). |
| Cost-benefit/ cost-effectiveness | Net savings of $21,705 for the 152 children in the sample, largely a result of the differences in the types of foster care settings and the length of stay observed among FTDC children. |
| Overall quality rating | Low. |

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### Specialist treatment: summary of evidence

Treatment for SUD comprises pharmacological interventions, such as maintenance for heroin users and medically assisted withdrawals, and a range of psychosocial interventions aiming to address psychological and/or social change. There are many different types of psychosocial interventions, with varying approaches according to their theoretical foundations (McGovern et al., 2021). Below is a summary of the 14 individual studies on specialist treatment included in this review, broken down by pharmacological treatment (n=4) and varying types of psychosocial only interventions (motivational enhancement therapy [n=4], contingency management [n=2]; reinforcement-based therapy [n=3]; intensive case management [n=1]).

#### Pharmacological treatment for pregnant women

Methadone and buprenorphine are pharmacological maintenance options for pregnant heroin users, releasing a steady dose of opiates to prevent the foetus from experiencing repeated withdrawals. In a Cochrane systematic review of methadone and buprenorphine for pregnant women with an opiate (viz. heroin) use disorder, Minozzi et al. (2020) reviewed four studies but could only pool results from two trials (Jones et al., 2005; Winklbaur-Hausknost et al., 2013), as evidence is lacking. They found that while methadone prescribed patients were less likely to drop out of treatment than those prescribed buprenorphine, they were more likely to be using illicit opiates at 15-18 week follow up. However, the quality of evidence was graded low to moderate because of high attrition and small sample sizes. Smith et al. (2009) aimed to evaluate the effectiveness of pharmacological interventions in pregnant women receiving treatment for an alcohol use disorder in their Cochrane systematic review but were unable to find a high-quality study to include, highlighting that research in this area is severely lacking.

Below are summaries of four individual studies which met the inclusion criteria for this review. Two very small double dummy, double blind RCTs compared the effectiveness of flexible dosing methadone with buprenorphine. The US study by Jones et al. (2005) and the Austrian trial by Fischer et al. (2006) compared the effectiveness of methadone with buprenorphine and both found that while the buprenorphine group were more likely to be retained in treatment, the methadone group were significantly more likely to reduce their illicit (i.e. non-prescribed) opioid use. Both studies had limited power to detect differences owing to a sample size of 30 and 18 respectively, however they served as pilot studies to the multisite (USA, Canada and Austria) MOTHER study (Winklbaur-Hausknost et al., 2013) which found no statistical differences in illicit opioid use between groups. Babies whose mother were taking buprenorphine were less likely to be delivered pre-term. No significant differences were found in terms of NAS outcomes.

Lander et al. (2015) compared therapy sessions for pregnant women on buprenorphine with mixed-gender sessions for men and women on buprenorphine and found no statistical difference on NAS or maternal treatment outcomes and relapse rates, suggesting that pharmacotherapy was driving the outcomes. However, the study had a very small sample size (n=45), short follow-up (4 weeks post-partum) and was heavily reliant on self-reports to measure effectiveness.

#### Psychosocial treatment

While the evidence base for psychosocial interventions for parents with SUD is larger than that for pharmacological ones, it is still limited as psychosocial interventions are wide ranging and very few studies exist for each type. A recent Cochrane systematic review of psychosocial interventions for parents by McGovern et al. (2021) was conducted concurrently with this review, and so covers the same literature on psychosocial interventions (albeit this review extends the literature search and has different inclusion criteria). The review found low-quality evidence that psychosocial treatments on their own may be ineffective in reducing substance use unless they are plus a parenting component.

Motivational enhancement therapy (MET) is a motivational intervention which aims to promote readiness to change behaviour and self-efficacy though a semi-structured interviewing style. Four papers examined the effectiveness of manualised MET, specifically for pregnant women. In a US RCT across four states, Winhusen et al. (2008) compared MET with treatment as usual and did not find any significant difference between the two conditions in terms of treatment retention or substance use. However, a subsequent study of the same sample (Osterman et al., 2017) focused on the participants who were using alcohol and found that MET did significantly better in terms of alcohol and illicit drug use, suggesting that MET may improve outcomes for some pregnant substance users but not all. However, compared with the 2008 study of 200 participants reasonably split between intervention and comparison arms (n=102 and 98 respectively), the 2017 study focused on outcomes for just 41 because of its focus on alcohol only, with almost double the amount of pregnant women in the intervention than comparison arm (n=27 and 14 respectively).

An RCT by Yonkers et al. (2012) compared MET plus cognitive behavioural therapy (CBT) with brief advice in sexual health clinics in two sites in Connecticut, USA. Both interventions were associated with reductions in substance use, and the authors found no significant differences in terms of substance use or likelihood of pre-term birth. Thus, both interventions could be regarded as suitable for pregnant women seeking to reduce their substance use. Using the same sample, Xu et al. (2017) found that that despite the intervention being more costly, there were no significant differences in overall medical costs. However, the analysis relied on too short a follow-up (three months post-partum) and did not include a measure of improvements on quality of life or societal costs, that would be necessary for a more robust evaluation of cost-effectiveness.

Contingency management (CM) is a form of therapy which provides reinforcements/ incentives, such as vouchers for remaining abstinent, to make substance use less attractive. Two US RCTs comparing CM interventions with treatment as usual were found. Both focused on CM for pregnant women with opioid and/ or cocaine use disorder in Maryland, Baltimore. Svikis et al. (2007) found that while CM did not decrease rates of early dropout, it was more effective in retaining pregnant women in treatment. Tuten et al. (2012) found CM participants were significantly more likely to be abstinent and to be retained in treatment compared with the comparison groups. However, both studies are limited by small sample sizes and very short follow-up periods of two weeks postpartum.

Reinforcement-based treatment (RBT) is an intensive behavioural psychosocial intervention with motivational interviewing and care management. A small US RCT compared the effectiveness of treatment as usual (residential care followed by recovery housing) with treatment as usual in addition to RBT for pregnant women using opioids and/or cocaine. Jones et al. (2011) reported that intervention mothers spent longer in treatment and in recovery housing. There were however no statistical differences in substance use or neonatal outcomes (except for neonates whose mothers were on the intervention arm spending fewer days in hospital). It is possible that the study has limited ability to detect power from the small sample size. Further bias may have been introduced to the study from a participation refusal rate of 43% and 17% failure to attend treatment following recruitment.

Community Reinforcement Approach (CRA) is another kind of intensive behavioural psychosocial intervention but built on the idea that a person’s environment affects their recovery. Slesnick and Erdem (2013) in their small RCT of CRA versus usual care for homeless women with SUD and young children found intervention mothers had a quicker reduction in alcohol use and increase in housing stability, however, by 9 months there were no significant differences found.

A US-based RCT compared CM dependent on negative cocaine urinalysis was compared with voucher control (not dependent on negative cocaine urinalysis), twelve-step facilitation and CRA (Schottenfeld et al., 2011). While the study included pregnant women, most participants were mothers (n=64 vs n=81). The study found CM to be effective compared with voucher control but did not find CRA to be more effective than twelve-step facilitation nor any differential efficacy of CM when paired with CRA or twelve-step facilitation.

In the context of parental SUD, case management (or care management) refers to the coordination of parental treatment and other community-based services, such as child welfare, mental health, housing and employment agencies. Cases are handled by managers or teams who deal with specific child welfare episodes through, *inter alia*, assessments, care planning, advocacy and monitoring. In contrast, intensive case management (ICM) is an American term for a longer-term model of care which regards dependency as a chronic relapsing condition from which people can take years to recover. As such, parents are provided with case management as well as assertive outreach over an extended period. Intensive case managers and teams have a comparatively smaller caseload and are usually available to provide support more often, e.g. during weekends and evenings.

The Jansson et al. (2005) RCT for postpartum women with an opioid and/or cocaine use disorder compared treatment retention and substance use outcomes among those receiving paediatric care with those receiving ICM in a community hospital in East Baltimore, USA. The authors found no significant difference in the likelihood of dropping out of treatment between the intervention and comparison group, nor of abstinence among opioid users in either research arm. The authors did report, however, that cocaine users receiving ICM were significantly more likely to test negative than those in the comparison group. Yet, as the follow-up period was just four months, the sample size was small (n=56) and the study recruits were mostly those who tested negative for drugs at delivery, it is unclear whether the evaluation was affected by bias and whether any observed abstinence would continue in the longer-term.

### Specialist treatment plus a parenting intervention: summary of evidence

While substance use can impact parenting capacity, parents who become abstinent do not necessarily become ‘good’ parents, just as parents who use substances are not necessarily ‘bad’ parents. Moreover, parents with SUD may themselves have been children of parents with SUD and may have limited if any experience of positive parent-child relationships. Parenting interventions in the context of parental SUD not only aim to improve parenting capacity and familial relationships, but they can also help parents become aware of how their substance use affects their children.

In recent years there have been several reviews on parental SUD and parenting interventions. For example, Moreland and McRae-Clark (2018) conducted a review of parental outcomes following treatment that offered a parenting skills component alongside usual care. While interventions and settings varied, the authors found improvement on parenting outcomes following engagement with treatment and a parenting intervention. Subsequently, a Cochrane review by McGovern et al. (2021) found that treatment plus parenting interventions may reduce alcohol and drug use among parents compared with treatment alone, albeit the authors emphasised that the evidence used to generate these results were of low quality according to the Cochrane grading system.

This section summarises the 14 individual evaluations of parenting interventions delivered alongside treatment, broken down by relational therapy (n=5), attachment-based therapy (n=4) and home-visitation interventions (n=5).

#### Relational therapy

Relational therapy aims to help people acknowledge the role interpersonal relationships play in shaping their experiences. Five US studies evaluated the effectiveness of different types of relational therapies. Luthar et al. (2007) in a 12-month RCT compared Relational Psychotherapy Mothers’ Group (RPMG) with recovery training in methadone clinics New Haven, Connecticut, USA. The intervention arm received 24 weekly sessions in addition to standard treatment, half of which were focused on parenting issues. Recovery training consisted of methadone plus group counselling sessions focusing on dependency and recovery. In comparison with recovery training, RPMG mothers showed marginal improvement on self-reported child abuse and neglect cocaine use detected via urinalysis. Their children experienced significantly greater emotional adjustment and depression outcomes. However, at 6 months follow-up, there were minimal differences between the intervention and control group.

Another US (New York) RCT by Gwadz et al. (2008), evaluated the effectiveness of Family First for problem drinking mothers compared with a single session of social/ motivational interviewing. Family First is a form of enhanced cognitive behavioural therapy (CBT) comprising 14-sessions lasting 90 minutes each on substance use/ problem drinking and parenting behaviour and skills. All mothers reduced alcohol and drug use, however there were no significant differences by the end of the reporting period between the intervention and control group. The study benefited from a long follow-up of 18 months post randomisation.

A small US RCT with 18-month follow up examined the effectiveness of an ecologically based family therapy (EBFT) compared with women’s health education found mothers assigned to EBFT showed a quicker reduction in substance use. However this was self-reported use. Reductions in use were also associated with better observed mother-child dyads (Slesnick & Zhang, 2016). EBFT is a 12 session family therapy, including CBT, targeting parent-child dyads, family support needs and problem-solving skills.

In a study for fathers only, Lam et al. (2009) analysed the effectiveness of Parent Skills with Behavioural Couples Therapy (PSBCT) for alcohol dependent fathers (n=30) in an outpatient treatment setting in the US. All participants attended 24 sessions, including CBT for the first 12 weeks. The intervention group received PSBCT, others regular BCT and a third group were randomly allocated to standard outpatient treatment for alcohol dependency. The authors found minimal differences between PSBCT and BCT on substance use, dyadic adjustment, and intimate partner violence, however effect sizes for PSBCT compared with BCT was larger in relation to parenting and child welfare involvement at 6 and 12 months. Both arms were significantly more effective than standard treatment.

Stover et al. (2019b) in a small US pilot RCT with a short follow-up of 3 months compared two psychosocial interventions aimed at fathers receiving treatment in a residential facility: Fathers for Change (F4C) is an integrated intervention targeting intimate partner violence and child maltreatment; Dads ‘n’ Kids (DNK) is a psychoeducational intervention focused on child development and behavioural parenting skills. Both interventions showed decreases in intimate partner violence. F4C showed some benefit over DNK regarding affect dysregulation symptoms and substance use relapse, albeit both groups increased their substance use following treatment.

#### Attachment-based therapy

The strength of infant-parent attachment is an established indicator of social and emotional development among children. Attachment-based parenting programmes in clinical treatment settings have been evaluated in a small US trial and a Finnish study. The outcomes of interest in these studies were improvements in child attachment and dyadic alignment, as well as maternal substance use.

Belt et al. (2012) evaluated the effectiveness of a psychodynamic mother–infant group psychotherapy (PGT) for perinatal women with a drug use disorder compared with individually tailored psychosocial support in Finland. Maternal hostility decreased signiﬁcantly in the intervention group, while intrusiveness decreased in both, but particularly in the intervention group. Both arms showed an increase in dyad quality and success in maternal abstinence, treatment retention, and lessening depressive symptoms. However, as the study was neither experimental nor quasi-experimental in design with a small sample, findings should be interpreted with caution.

The Mothers and Toddlers Programme (MTP) is an attachment-based programme comprising 12 hourly sessions on parenting for mothers in an outpatient treatment setting (Suchman et al., 2018; Suchman et al., 2010; Suchman et al., 2017). At 12-month follow up, intervention mothers demonstrated significantly greater compassion and dyadic alignment than the treatment as usual arm. As addiction severity increased, the intervention appeared to be a protective factor for dyadic interactions, and child attachment, albeit not all differences were statistically significant. Intervention mothers were less likely to have a heroin relapse, while rates of other opioid relapse were neglible in both arms. Cocaine relapse rates were similar in both arns. (Suchman et al., 2017).

#### Home-visitation interventions

Five studies (two Australian, one from the USA, one Canadian and one from the UK) evaluated the effectiveness of treatment plus parenting interventions delivered in the parental home. The UK and Canadian studies include a cost-effectiveness analysis.

A moderate quality Australian RCT by Bartu et al. (2006) investigated the effect of eight home‐visitations for women up to six months after giving birth on breastfeeding, immunisation uptake and drug use compared with telephone contact. The semi-structured home visitation intervention allowed for midwives to respond to clinical and social support needs as they arose. Both research arms demonstrated reduced drug use during pregnancy but an increase by six months. Furthermore, immunisation rates were similar for each group and median breastfeeding duration for intervention group was eight weeks compared with ten weeks for the comparison group.

The Parents under Pressure (PuP) programme is a 24-week home-visitation intervention for primary caregivers (male and female) of children younger than 2.5 years receiving methadone treatment. It comprises 12 modules relating to parenting and coping skills within a care management structure, meaning parents can also receive support outside of these times should they need it. A Brisbane, Australia RCT reported that intervention parents demonstrated significant improvements across several areas such as stress and child abuse potential, although a sizable proportion (36%) of the group maintained their high-risk status (Dawe & Harnett, 2007). The promising findings of the programme were substantiated in the UK RCT by (Barlow et al., 2019)which benefited from a better study design: the UK RCT was close to real-world conditions across several sites with a comprehensive cost-effectiveness analysis. The authors reported that the intervention had a 52% probability of cost-effectiveness at a willingness to pay (WTP) £1,000 per unit of Brief Child Abuse Potential (BCAP) Inventory score improvement and a 98% probability at WTP of £20,000. As there is no established WTP of a BCAP unit improvement, it is not possible to determine with any confidence that the intervention is cost-effective. In addition, when using QALY gains to measure cost-effectiveness (derived from the EQ-5D-5L), the authors found that the intervention was above the National Institute for Health and Care Excellence (NICE) threshold of £20-30,000 per QALY gain at about £34,000 and so would not be considered as cost-effective by NICE.

One paper evaluated the effectiveness of the Parent-Child Assistance Programme (P-CAP), a three-year home visitation intervention for women who have delivered at least one child exposed to substances. Care managers are paraprofessionals typically working with 15 families and supporting women to receive treatment and access relevant community agencies such as mental health providers and employment support services. A US study rated low quality by Grant et al. (2005) showed P-CAP to be effective in terms of reductions in substance use and likelihood of treatment completion. Encouragingly, a high-quality cost-effectiveness analysis of P-CAP in Alberta, Canada focusing on preventing foetal alcohol spectrum disorder (FASD) reported an ICER of $97,000 and net monetary benefit of $22m (Thanh et al., 2015). The probabilities in the model were largely derived from local data making results very applicable to local Alberta decision-makers. It is not clear, whether the results are generalizable outside of Alberta, however.

The available evidence suggests that parenting interventions delivered in the home alongside specialist treatment may be an effective use of resources in the UK compared with treatment as usual. Its cost-effectiveness, however, is not clear.

### Specialist treatment plus statutory child welfare support: summary of evidence

Studies in this category focus on families in which children have been previously or are currently in care, and/or are at risk of being removed from their parents’ care. As such, they represent the most extreme cases of familial vulnerability and risk of harm associated with parental SUD.

A systematic review by Murphy et al. (2017) explored the effectiveness of interventions addressing parental substance use for families involved with the statutory child welfare system. All effective interventions in terms of treatment completion and family reunification, irrespective of the treatment model, provided comprehensive individually tailored support, which the authors highlighted as key to success. Another review for mothers by Neo et al. (2021) found few high-quality studies for inclusion. Results suggested that integrated programmes appear to produce beneficial outcomes, specifically treatment completion, reduction in maternal substance use and/or families staying together. However, more robust research is needed to support this finding.

23 individual studies are included in this section, firstly categorised by those without a parenting intervention (n=5) and then those with a parenting intervention (n= 7). These are followed by studies on family treatment drug courts (n=11).

#### Without a parenting intervention

Five studies from the US evaluated the effectiveness of different types of treatment plus statutory child welfare support, without a parenting intervention component. Huebner et al. (2012) evaluated the effectiveness of The Sobriety Treatment and Recovery Teams (START) using a quasi-experimental design. START partners child welfare workers with treatment providers. START workers receive substance use and motivational interviewing training and have a relatively small caseload. Mothers were almost twice as likely to become abstinent following completion, and treatment was significantly associated with children remaining in the care of their parents. The rate of abstinence among fathers, however, was much lower than mothers.

In contrast, Barth et al. (2006) found that parents receiving treatment in their relatively large quasi-experimental study covering 36 US states were more likely to be referred to child services for recurring abuse than those in the comparison group. The authors explained this could be the result of a significant statistical difference between the two research conditions (with the treatment arm being more complex). In addition, as the treatment group would have been known to both adult treatment and child welfare services, they would have been more closely scrutinised than the comparison group. The impact on recurring abuse of the frequency of treatment sessions, the types of treatment received and their outcomes were not analysed.

Morgenstern et al. (2006), in their high-quality evaluation of intensive case management (ICM) compared with treatment as usual in Essex County, New Jersey USA, found that their intervention arm were statistically almost twice as likely to be abstinent at the 15 month follow-up than mothers in the comparison group. The form of ICM evaluated comprised weekly sessions for up to 12 months focusing on treatment and employment, then tapered sessions up to 24 months. As the intervention did not directly target child welfare outcomes, it did not include coordination with child welfare services. Treatment as usual was defined as appropriate referrals made by a clinical care coordinator. However, the small sample size in one location limit generalisability of the results. Dauber et al. (2012), building on the Morgenstern et al. (2006) paper, found little effect of parental treatment on child welfare outcomes. Moreover, the authors reported that while ICM had an impact on reunification within the first year, this observed difference reduced over time, as ICM was designed to be most intensive in the first twelve months.

A high-quality study reported parent and child outcomes from an ICM programme in Chicago and suburban Cook County, Illinois (Ryan et al., 2006). ICM in the form of recovery coaches was randomly assigned to parents whose children had been put into care. Families in the intervention arm were significantly more likely to be reunified than the comparison group and refer to a cost saving of around $59,000 based on the cost of the IV-E waiver which allows the state of Illinois to evade federal rules relating to foster care financing to develop approaches for families. However, the authors did not conduct a full and robust economic evaluation. The reporting of cost savings is a big limitation of the study as it did not compare pertinent costs, such as treatment, over an appropriate length of time.

#### With a parenting intervention

Seven studies (two from the UK) evaluated the effectiveness of different types of treatment plus statutory child welfare support, with a parenting intervention component.

Forrester et al. (2008) and Forrester et al. (2014) in their moderate quality study analysed the impact of an Intensive Family Preservation Service (a.k.a. ‘Option 2’) in Wales: an intensive four-week home-based case management intervention which targeted parental substance users whose children were at risk of being placed into care. Workers were paraprofessionals incorporating motivational interviewing techniques, on call 24/7 and working with one family at a time. The quasi-experimental study found that the likelihood of entering care was the same for both the intervention and comparison groups (about 40%), however children receiving the intervention took longer to enter care and spent significantly fewer days in care. This resulted in a benefit-cost ratio of 1.54. At follow-up (up to 5.6 years), intervention children were significantly more likely to be at home than comparison children. It should be noted that costs data related to placement costs only. Other pertinent expenses such as social worker allocation were not included. While this would underestimate the overall costs there is likely to be little difference between the intervention and comparison groups. However, there may well be differences in service usage outside the realm of social work, which may impact cost-benefit findings, namely parental treatment, education, criminal justice and health. It is not clear whether the intervention would remain cost-beneficial were such outcome costs included in the cost-benefit analysis. Further, the comparison group received a range of services that were not identified, making it difficult to demonstrate either effectiveness or cost-effectiveness of the intervention. The positive ﬁndings of Option 2 has contributed to an adapted version being rolled out across Wales, as well as in some local authorities in England.

A low quality trial by Brown et al. (2021) evaluated the efficacy of a pilot six-session mindfulness approach trial for families affected by parental substance use who were involved with statutory child welfare services, compared with usual support provided by statutory child welfare services (which may or may not include specialist treatment). In addition to mindfulness techniques, participants were provided with psychoeducational treatment and parenting training. Both intervention and control groups decreased their substance use. Compared to the control group, intervention participants experienced reductions in parenting stress and child abuse potential, among other positive indicators. Thus, the findings suggest that mindfulness-informed interventions may be therapeutically beneficial and are feasible for parents with substance use disorder involved with the child welfare system. However, more research is needed, particularly given the extremely small sample and lack of follow-up.

A small moderate quality RCT in an unspecified county of the US by Donohue et al. (2014) evaluated the effectiveness of a family-based therapy for mothers. The study had a relatively reasonable follow-up of 10 months post randomisation. All mothers in the study decreased their drug use and child neglect potential, irrespective of whether they received family-based therapy or treatment as usual, and there were no differences found in treatment retention. Despite all mothers having SUD and reported as maltreating their children, not all children had been reportedly exposed to their mother’s drug use. The study found that the mothers of children who were not drug exposed had better outcomes overall, particularly those receiving family-based therapy.

The strengthening families programme (SFP) began as an intervention for 10–14-year-olds using substances but has expanded to support families affected by parental substance use. The programme comprises manualised group session intervention lasting 14 weeks parenting and family skills, as well as substance use. A quasi-experimental longitudinal study of SFP across 10 sites in Kansas, USA, by Akin et al. (2017), analysed time spent in care over a five year period. The authors found no statistical difference in reunification between families in which parents were receiving a standard parenting intervention compared with SFP. Yet, while controlling for a range of characteristics, significant predictors of re-entry into care were found: removal due to child behaviour, poverty, and reunification between 15 and 18 months (compared with reunification in <15 months).

A low quality study by Saldana (2015) evaluated the effectiveness of the Family Actively Improving Relationships (FAIR) US pilot on concurrent parental substance use disorder and child neglect among. FAIR is an eight-month treatment programme which incorporates elements of Parent Management Training and reinforcement-based treatment (RBT). Sessions occur in the home and other environments in the community and support is available 24/7. Modules consist of parenting skills, addressing substance use and hands on parenting coaching. Negative drug screens and other positive behaviours are reinforced with voucher incentives. Intervention mothers were more likely to engage and complete treatment than those in the comparison and saw significant improvements in parenting, substance use and mental health and auxiliary needs. The study was limited by a small sample size, the study was limited geographically, and there was a high level of attrition between follow-up points.

Another home-based intervention with an RBT for families known to statutory child welfare services was evaluated by Schaeffer et al. (2013). The low-quality pilot of Multisystemic Therapy-Building Stronger Families (MST-BSF) in New Britain, Connecticut, USA, was compared with comprehensive community treatment and effectiveness measured in terms of subsequent maltreatment and reunification. The small scale quasi-experimental study with 24-month follow-up found that interventions mothers showed significant reductions in alcohol and drug use, as well as depressive symptoms. Intervention children did experience significantly fewer incidences of abuse and significantly fewer days in out-of-home placements. Notably, the researchers were unable to establish the number of treatment services mothers in the comparison group received thereby increasing the probability that the comparative superior effectiveness of the intervention was due to mothers receiving more treatment rather than the intervention itself.

#### Family treatment drug courts

The review found 11 studies of family treatment drug courts (FTDCs), known as family drug and alcohol courts (FDACs) in England. FTDCs are specialist courts dealing with parents who use substances and are at risk of having their children put into care. Originally established in the US, most states have implemented an FTDC. Encouraged by the promising findings emerging from the US and rooted in concerns about the lack of coordination between adult and children’s services and the high costs of standard proceedings (Harwin et al., 2014), three pilot sites were established in London. In 2023, there were 14 services working in 22 family courts in 38 English local authorities.

The main aim of FTDCs is permanency. An ancillary and associated objective is for parents to complete a treatment programme and recover from their dependency. To achieve these goals, multidisciplinary teams comprising judicial representatives and adult treatment and child social workers support families and monitor progress in a typically for one year. Collaborative working and regular monitoring expedite access to treatment for parents at the start of court proceedings and later on should they complete treatment and then relapse. Two types of courts exist: ‘integrated’ whereby an FTDC judge supervises the entire case and ‘parallel’ whereby an FTDC judge oversees the treatment aspect and another judge oversees child welfare matters. To graduate, parents must successfully complete treatment, sustain their recovery for a pre-specified amount of time and demonstrate that they can provide safe and stable living environments for their children.

The evidence appears to support that FTDC parents are more likely to enter treatment and remain in treatment for longer; with four studies observing that FTDC parents received more treatment episodes than comparison parents (Bruns et al., 2012; Chuang et al., 2012; Green et al., 2007; Worcel et al., 2008). The Boles et al. (2007) parallel FTDC study on the other hand, found that while intervention parents were more likely to enter treatment than the comparison group, they spent significantly fewer days in treatment and there were no observed differences in the likelihood of completing treatment. A lack of significance in successful completion treatment was also found in later study of an integrated FTDC with wraparound services by Bruns et al. (2012). Such differences could partly be explained by variations in the types and frequency of treatment offered to parents, which ranged from regular attendance at AA meetings to intensive residential treatment.

In England, mothers in the FTDC programme were significantly more likely to stop using substances and when compared with mothers who were reunified with their children, intervention mothers were significantly more likely to sustain their recovery during a five-year follow-up period (the longest follow-up period of any other study) (Harwin et al., 2018; Harwin et al., 2016; Harwin et al., 2014). The authors found no significant differences observed in the time it took to achieve permanency over five years although families were significantly more likely to remain together/ be reunited at the end of court proceedings and at subsequent follow-ups. While the evaluations of the English FTDC are arguably more applicable to the aims of this review than the US studies, the analysis of outcomes in inner-London sites only may limit the applicability of the results to other English jurisdictions.

Studies reported that intervention children were significantly less likely to return to foster care after achieving permanency (Chuang et al., 2012; Green et al., 2007; Zeller et al., 2007). These findings may be the result of FTDC families being under greater scrutiny even after completion of the programme (Bruns et al., 2012; Green et al., 2007) or a reflection of the relatively short follow-up period of studies (Harwin et al., 2018).

One study in within the context of an FTDC compared different types of treatment intervention. The findings from the small scale Engaging Moms Program [*sic*.] – a form of multidimensional family therapy for mothers with SUD adapted for use within a Florida, USA family treatment drug court setting – suggested that compared with ICM, treatment plus other interventions such as those focusing on motivation and supporting parenting skills and family relationship building, can provide greater parental and filial outcomes in terms of reduction in substance use and family reunification (Dakof et al., 2010).

The increased likelihood of family reunification associated with FTDC participation should correspond to gross short-term savings to the authority with financial responsibility. Three studies explored costs and outcomes but fell short of being robust economic evaluations. Zeller et al. (2007) reported net savings of $21,705 for the 152 children in their sample, largely a result of the differences in the types of foster care settings and the length of stay observed among FTDC children. Burrus et al. (2011) found that FTDC was not cost-effective during the follow-up period of the study (12 months), albeit it did result in an estimated net saving of circa $5,500 when modelling future foster care savings for children up until the age of 18, thereby assuming the study results would continue for many years after families were reunified. Harwin et al. (2014) estimated that the cost of the FDAC team per family (£8,740) was offset by the savings resulting from reunification, despite the study finding no significant difference in achieving reunification and permanency.

## Summary of findings from the review

There are a handful of studies on pharmacological treatment for parents all of which centre on heroin using pregnant women. This is perhaps not surprising given that pregnant women with an opiate use disorder are more likely to experience obstetrical complications, while newborns exposed to opiates in utero have a high likelihood of experiencing withdrawal, among other serious and potentially fatal complications (Coyle et al., 2012; Minozzi et al., 2020). Results suggest that pharmacological treatment may be effective for pregnant women (and their neonates), with little difference in outcomes between types of medication prescribed.

There were mixed results for psychosocial treatments that did not include a parenting intervention, with moderate to high quality evidence showing that contingency management may have favourable outcomes for pregnant women, and high-quality evidence that intensive case management may be effective for postpartum cocaine using mothers.

Parenting interventions can improve parenting capacity and relationships, as well as helping parents become aware of how their substance use affects their children. Compared with specialist treatment alone, the evidence suggests that treatment plus a parenting intervention may be effective in reducing parental substance use and improving parent-infant dyads. Relational therapies may enhance outcomes, but this may not be sustained over a long period. Attachment-based programmes are feasible and appear to be effective, while high quality studies suggest that home visitation interventions appear to be effective and cost-effective, including in the UK context.

Families in which children have been previously or are currently in care, and/or are at risk of being removed from their parents’ care represent the most extreme cases of harm associated with parental SUD. Thus, it is perhaps not surprising that for those involved with statutory child welfare services, intensive and comprehensive specialist treatment interventions appear to be the most effective. Additional parenting interventions may also be effective for this cohort, but studies were mostly of low quality. The evidence supporting family treatment drug courts is quasi-experimental with the economic evidence lacking in robustness.

The body of evidence on specialist treatment, treatment plus parenting interventions and plus child welfare is too small to be confident in the interpretation of results and most studies were of low-moderate quality. Given how few robust studies there are, it is not possible to say with confidence which types of interventions might be more effective or cost-effective for pregnant women or parents with SUD. Furthermore, studies of parents were predominantly of mothers thus impeding further our understanding of the effectiveness of interventions on fathers. Generalisability was also hindered by the fact that interventions had varied measures of effectiveness/ cost-effectiveness and contexts in which they were delivered.

Most studies, in particular those evaluating interventions for pregnant women had short follow-up periods. While with a longer the follow-up period it is harder to attribute outcomes solely to the programme, longer follow-up periods are necessary to understand whether positive short-term outcomes observed continue. SUD is a chronic health condition which can involve multiple episodes of treatment, abstinence and relapse, which in turn may affect parent and child outcomes over time. It is possible that in the longer-term, remaining with a primary caregiver and not being placed in care is a bad outcome for some children.

Parental outcomes tended to focus on treatment retention and completion, and reductions in substance use, assuming that changes in substance use behaviour would improve outcomes for children. Where child outcomes were recorded these were generally either neonatal or after a child was taken into care. These children represent those most at risk. What is yet to be understood from the evidence base is whether parental SUD treatment may prevent children having to be removed from their family in the first place.

Finally, most studies were from the US, thereby limiting generalisability of effectiveness and cost-effectiveness results in the wider English context. In particular, the American and English legal, child welfare and treatment systems are substantially different, with further notable differences in the types of drugs used by parents also apparent. In England*,* cases typically enter court at a later stage, residential treatment facilities are less frequently used, and the use of lower threshold services such Alcoholics Anonymous and Narcotics Anonymous are not essential parts of a treatment care plan (Gifford et al., 2014).

A key limitation of this chapter is that there was only one reviewer and so there is a risk of bias in the study selection procedure and quality assessment. Many papers were found from forward and backward citation searching suggesting that the electronic database search was not comprehensive enough. However, papers included and findings are consistent with recent reviews on interventions for parents with SUD (McGovern et al., 2021; Minozzi et al., 2020; Moreland & McRae-Clark, 2018; Murphy et al., 2017; Neo et al., 2021; Smith et al., 2009).

This chapter makes clear the need for more effective and cost-effective research on interventions for parents with SUD, especially in the English context.

## Ovid MEDLINE Search strategy

1. drug users/ or exp substance-related disorders/ or exp alcoholism/

2. ((psychotropic drug\* or street drug\* or substance$ or alcohol\* or drug\* or polydrug\* or polysubstance\* or stimulant\* or heroin or opioid\* or opiate\* or cocaine or crack or methadone or subutex or ecstasy or methamphetamine\* or crystal meth or amphetamine\* or cannabis or marijuana or LSD or mephedrone or khat) adj2 (user or using or misuse or misusing or depend\* or addict\* or disorder or abstain\* or abstinen\* or withdrawal or intoxicat\* or problem)).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

3. 1 or 2

4. (parent\* or family or families or guardian\* or mother or maternal or father or paternal or mum or dad).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

5. exp "PARENTS"/ or "CHILD OF IMPAIRED PARENTS"/

6. 4 or 5

7. 3 and 6

8. (social care or social service\* or social work\* or child welfare or social support or child protect\* or care work or care officer).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

9. (treatment or recovery or rehab\* or detox\* or psychosocial or psychological or pharmaco\* or case management or assess\*).mp. [mp=title, abstract, original title, name of substance word, subject heading word, keyword heading word, protocol supplementary concept word, rare disease supplementary concept word, unique identifier, synonyms]

10. 7 and 8

11. 7 and 9

12. 10 or 11

13. economics/

14. "costs and cost analysis"/

15. cost allocation/

16. cost-benefit analysis/

17. cost control/

18. cost of illness/

19. cost sharing/

20. "deductibles and coinsurance"/

21. medical savings accounts/

22. health care costs/

23. direct service costs/

24. drug costs/

25. employer health costs/

26. hospital costs/

27. health expenditures/

28. capital expenditures/

29. value of life/

30. exp economics, hospital/

31. exp economics, medical/

32. economics, nursing/

33. economics, pharmaceutical/

34. exp "fees and charges"/

35. exp budgets/

36. (low adj cost).mp.

37. (high adj cost).mp.

38. (health?care adj cost$).mp.

39. (fiscal or funding or financial or finance).tw.

40. (cost adj estimate$).mp.

41. (cost adj variable).mp.

42. (unit adj cost$).mp.

43. (economic$ or pharmacoeconomic$ or price$ or pricing).tw.

44. or/13-43

45. 12 and 44

46. meta-analysis as topic/

47. meta analy$.tw.

48. metaanaly$.tw.

49. meta-analysis/

50. (systematic adj (review$1 or overview$1)).tw.

51. exp review literature as topic/

52. or/46-51

53. cochrane.ab.

54. embase.ab.

55. (psychlit or psyclit).ab.

56. (psychinfo or psycinfo).ab.

57. (cinahl or cinhal).ab.

58. science citation index.ab.

59. bids.ab.

60. cancerlit.ab.

61. or/53-60

62. reference list$.ab.

63. bibliograph$.ab.

64. hand-search$ab.

65. relevant journals.ab.

66. manual search$.ab.

67. or/62-66

68. selection criteria.ab.

69. data extraction.ab.

70. 68 or 69

71. comment/

72. letter/

73. editorial/

74. animal/

75. human/

76. 74 not (73 and 74))

77. or/71-73,76

78. 52 or 67 or 70

79. 78 not 77

80. 12 and 7

# Appendix B Supplementary tables

*Table B‑1 Statistics comparing similarity of multiple imputation model results (n=1,150,580)*

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Baseline covariates | Model number | | | | | | | | |
| 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|  | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) |
| Child living arrangements: |  |  |  |  |  |  |  |  |  |
| Not living with child | 0.015 (0.986) | 0.015 (0.986) | 0.015 (0.989) | 0.015 (0.994) | 0.015 (0.984) | 0.015 (0.958) | 0.015 (0.993) | 0.015 (0.994) | 0.015 (1.000) |
| Drug category: |  |  |  |  |  |  |  |  |  |
| Alcohol and non-OU | 0.023 (0.990) | 0.023 (0.982) | 0.023 (0.995) | 0.023 (0.987) | 0.023 (0.994) | 0.023 (0.985) | 0.023 (0.991) | 0.023 (0.978) | 0.023 (0.995) |
| OU | 0.021 (0.979) | 0.021 (0.950) | 0.021 (0.957) | 0.021 (0.998) | 0.021 (0.995) | 0.021 (0.979) | 0.021 (0.990) | 0.021 (0.974) | 0.021 (0.995) |
| Alcohol only | 0.020 (0.982) | 0.020 (0.959) | 0.020 (0.963) | 0.020 (0.981) | 0.020 (0.974) | 0.020 (0.969) | 0.020 (0.986) | 0.020 (0.967) | 0.020 (0.998) |
| Intervention: |  |  |  |  |  |  |  |  |  |
| Family help | 0.019 (0.832) | 0.019 (0.912) | 0.019 (0.711) | 0.019 (0.983) | 0.019 (0.964) | 0.019 (0.958) | 0.019 (0.800) | 0.019 (0.903) | 0.019 (0.817) |
| Intensive | 0.019 (0.856) | 0.019 (0.608) | 0.019 (0.571) | 0.019 (0.874) | 0.019 (0.784) | 0.019 (0.830) | 0.019 (0.772) | 0.019 (0.673) | 0.019 (0.957) |
| Pregnant | 0.053 (0.834) | 0.053 (0.971) | 0.053 (0.822) | 0.053 (0.948) | 0.053 (0.988) | 0.053 (0.970) | 0.053 (0.903) | 0.053 (0.956) | 0.053 (0.927) |
| Aged 18-24 | 0.031 (0.989) | 0.031 (0.964) | 0.031 (0.989) | 0.031 (0.987) | 0.031 (0.981) | 0.031 (0.983) | 0.031 (0.993) | 0.031 (0.981) | 0.031 (0.999) |
| Female | 0.013 (0.993) | 0.013 (0.907) | 0.013 (0.980) | 0.013 (0.987) | 0.013 (0.941) | 0.013 (0.968) | 0.013 (0.983) | 0.013 (0.992) | 0.013 (0.991) |
| NEET | 0.014 (0.859) | 0.014 (0.931) | 0.014 (0.707) | 0.014 (0.962) | 0.014 (0.977) | 0.014 (0.881) | 0.014 (0.921) | 0.014 (0.999) | 0.014 (0.818) |
| Housing problem | 0.015 (0.993) | 0.015 (0.998) | 0.015 (0.901) | 0.015 (0.986) | 0.015 (0.989) | 0.015 (0.950) | 0.015 (0.900) | 0.015 (0.979) | 0.015 (0.997) |
| Mental health treatment need | 0.012 (0.964) | 0.012 (0.930) | 0.012 (0.841) | 0.012 (0.816) | 0.012 (0.858) | 0.012 (0.856) | 0.012 (0.781) | 0.012 (0.704) | 0.012 (0.843) |
| *Constant* | *0.022 (0.956)* | *0.022 (0.958)* | *0.022 (0.996)* | *0.022 (0.988)* | *0.022 (0.953)* | *0.022 (0.973)* | *0.022 (0.921)* | *0.022 (0.968)* | *0.022 (0.953)* |

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Baseline covariates | Model number | | | | | | | | |  |
| 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 |
|  | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) | SE (p-value) |
| Parent category: |  |  |  |  |  |  |  |  |  |  |
| Not living with child | 0.015 (0.977) | 0.015 (0.994) | 0.015 (0.973) | 0.015 (0.960) | 0.015 (0.955) | 0.015 (0.934) | 0.015 (0.947) | 0.015 (0.936) | 0.015 (0.970) | 0.015 (0.926) |
| Drug category: |  |  |  |  |  |  |  |  |  |  |
| Alcohol and non-OU | 0.023 (0.985) | 0.023 (0.992) | 0.023 (0.995) | 0.023 (1.000) | 0.023 (0.985) | 0.023 (0.997) | 0.023 (0.994) | 0.023 (0.993) | 0.023 (0.996) | 0.023 (0.998) |
| OU | 0.021 (0.986) | 0.021 (0.957) | 0.021 (0.968) | 0.021 (0.999) | 0.021 (0.990) | 0.021 (0.981) | 0.021 (0.995) | 0.021 (0.959) | 0.021 (0.975) | 0.021 (0.978) |
| Alcohol only | 0.020 (0.974) | 0.020 (0.976) | 0.020 (0.994) | 0.020 (0.986) | 0.020 (0.969) | 0.020 (0.993) | 0.020 (1.000) | 0.020 (0.997) | 0.020 (0.974) | 0.020 (0.984) |
| Intervention: |  |  |  |  |  |  |  |  |  |  |
| Family help | 0.019 (0.807) | 0.019 (0.666) | 0.019 (0.816) | 0.019 (0.849) | 0.019 (0.980) | 0.019 (0.685) | 0.019 (0.809) | 0.019 (0.997) | 0.019 (0.954) | 0.019 (0.856) |
| Intensive | 0.019 (0.690) | 0.019 (0.688) | 0.019 (0.968) | 0.019 (0.864) | 0.019 (0.787) | 0.019 (0.964) | 0.019 (0.927) | 0.019 (0.905) | 0.019 (0.827) | 0.019 (0.932) |
| Pregnant | 0.053 (0.885) | 0.053 (0.986) | 0.053 (0.929) | 0.053 (0.957) | 0.053 (0.981) | 0.053 (0.897) | 0.053 (1.000) | 0.053 (0.975) | 0.053 (0.969) | 0.053 (0.978) |
| Aged 18-24 | 0.031 (0.974) | 0.031 (0.987) | 0.031 (0.997) | 0.031 (0.994) | 0.031 (0.979) | 0.031 (0.996) | 0.031 (0.992) | 0.031 (0.998) | 0.031 (0.980) | 0.031 (0.992) |
| Female | 0.013 (0.936) | 0.013 (0.988) | 0.013 (0.976) | 0.013 (0.971) | 0.013 (0.930) | 0.013 (0.982) | 0.013 (0.917) | 0.013 (0.983) | 0.013 (0.929) | 0.013 (0.972) |
| NEET | 0.014 (0.942) | 0.014 (0.767) | 0.014 (0.776) | 0.014 (0.977) | 0.014 (0.771) | 0.014 (0.922) | 0.014 (0.746) | 0.014 (0.664) | 0.014 (0.928) | 0.014 (0.846) |
| Housing problem | 0.015 (0.959) | 0.015 (0.955) | 0.015 (1.000) | 0.015 (0.980) | 0.015 (0.976) | 0.015 (0.931) | 0.015 (0.969) | 0.015 (0.998) | 0.015 (0.941) | 0.015 (0.947) |
| Mental health treatment need | 0.012 (0.963) | 0.012 (0.998) | 0.012 (0.885) | 0.012 (0.835) | 0.012 (0.909) | 0.012 (0.920) | 0.012 (0.770) | 0.012 (0.811) | 0.012 (0.879) | 0.012 (0.934) |
| *Constant* | *0.022 (0.951)* | *0.022 (0.932)* | *0.022 (0.939)* | *0.022 (0.962)* | *0.022 (0.926)* | *0.022 (0.941)* | *0.022 (0.882)* | *0.022 (0.950)* | *0.022 (0.931)* | *0.022 (0.952)* |

*Notes: Multinomial logistic regression. Model statistics: LR X2 (d.f.323) = 7.01, p=1.000, Pseudo R2=0.000*

1. In 2021, I began collecting case studies of families affected by parental SUD that were receiving treatment to see whether I could estimate any cost savings to the local authority which funded the treatment. I then used what I learned to provide local areas with the tools they would need to estimate the benefits of investing in families themselves which included a guide to using case studies, a workbook containing relevant costs, a Why Invest? slide pack to be adapted and shared by our commissioners and a recorded webinar on my methods and examples of how they were adopted. This year many of the resources will be updated and available on a new unmet need toolkit for parents and carers on [www.ndtms.net](http://www.ndtms.net). [↑](#footnote-ref-2)
2. <https://www.gov.uk/government/collections/family-hubs-and-start-for-life-programme> [↑](#footnote-ref-3)