



PhD thesis

Estimating provisional causal treatment effects on reoffending for binary and multiple treatments using quasi-experimental methods for people in prison with an alcohol use disorder in England
Sondhi, A.

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**Estimating Provisional Causal Treatment Effects on Reoffending for
Binary and Multiple treatments using Quasi-Experimental Methods for
People in Prison with an Alcohol Use Disorder in England**

Arun Sondhi

A PhD thesis submitted to Middlesex University

School of Health & Education, Department of Mental Health & Social Work

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ABSTRACT

Aim:

Little is known as to the efficacy of criminal justice treatment interventions for people in prison with an alcohol use disorder (AUD) to reduce reoffending. Prison-based treatment aims to provide pharmacological and psychosocial interventions that address physical and mental health needs concurrently with approaches to deal with recidivism. This thesis determines whether there is a ‘provisional’ causal treatment effect in reduced re-offending post-release for people in prison receiving treatment for an AUD. Quasi experimental methods that derive a treatment effect will be assessed for a single (or binary) treatment system and where multiple treatments exist. The validity of using these methods in criminal justice settings will also be assessed.

Method:

Two quasi-experimental methods were applied; (1) a quasi-experimental propensity score matched (PSM) observational study to calculate the average treatment effect on reoffending compared to a matched control group and (2) multiple treatment effect estimators for pharmacological treatment only; Risk-Need-Responsivity (RNR) compliant treatment; and ‘other’ psychosocial interventions compared to a control group. 26,654 people in prison with an AUD were linked across five management information systems with 56-60% successfully matched across databases. For PSM, a one-to-one match without replacement and a marginal Cox proportional hazards time-to-event model were used with only treatment as a prognostic and the inverse proportional weights (derived from a one-to-one matching) as covariates as recommended by Austin (2010). Four regression-based treatment effect estimators were deployed to compare the effectiveness of the three treatment groups compared to controls.

The analysis was supplemented by qualitative interviews with operational and strategic stakeholders involved in prison-based AUD treatment.

Results:

Overall, no statistically significant difference in reoffending rates and risk of reoffending on release were noted. The findings were dependent on whether static or dynamic covariates were included. The outcome for RNR-compliant treatment suggest a lower recidivism rate compared to the control group. Pharmacological-only treatment results in a statistically significant higher level of reoffending relative to the untreated group. Regression-based methods of deriving a treatment effect from observational studies are potentially affected by sample size. The treatment effect using propensity score matching is affected by the number of covariates included in the model. Poor quality or missing data were shown to adversely affect confidence levels. The use of quasi-experimental methods to determine a treatment effect is subject to a wide range of researcher assumptions and requires transparency to ensure there is sufficient equivalence (balance) across treated and comparison groups.

Conclusion:

The creation of a universal system of ‘equivalence of care’ framed within a public health context in English prisons may have had an unintended consequence of diluting approaches that reduce recidivism. People in prison with an AUD present with different needs than other segments of substance misuser. There is an opportunity to develop an AUD-focused and cross-disciplinary model for prison-based treatment that unites public health and effective crime reduction approaches. Quasi-experimental methods provide an alternative to randomisation but require methodological enhancements to reliably calculate a treatment effect.

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For my children, Isla, Jack and Max.

Finally, a huge thanks to my wife Jessica, for pretty much everything else.

LIST OF ABBREVIATIONS

AIPW	Augmented inverse probability (of treatment) weighting
ATE	Average treatment effect
AUD	Alcohol use disorder
AUDIT	Alcohol Use Disorder Identification Test
CARAT	Counselling, Assessment, Referral, Advice and Throughcare
CBT	Cognitive behavioural therapy
CI	Confidence Interval
CRC	Community Rehabilitation Companies
DSM	Diagnostic and Statistical Manual of Mental Disorders
IDTS	Integrated Drug Treatment System
IPW	Inverse probability (of treatment) weighting
IPWRA	Inverse probability (of treatment) weighted regression adjustment
ITT	Intention-to-Treat
NDTMS	National Drug Treatment Monitoring System
NTORS	National Drug Treatment Outcome Study
NHS	National Health Service
OASys	Offender Assessment System
OBP	Offender Behavioural Programme
OGRS	Offender Group Reconviction Scale
OR	Odds Ratio
PHE	Public Health England
PNC	Police National Computer
POM	Potential Outcome Means
PSI	Psychosocial interventions

PSM	Propensity Score Matching
RA	Regression adjustment
RNR	Risk Need Responsivity
TC	Therapeutic Communities

Chapter 1: Introduction

1.1 Introduction

Treating alcohol dependence and excessive consumption to reduce reoffending post release from prison forms a major component of the Government's anti-crime strategy (HM Government, 2017). The cessation or curtailment of excessive drinking, within the context of prosocial lifestyle changes (starting one's 'recovery') is a strongly associated with reducing offending (or to 'desist' from crime). 'Treatment' comprising pharmacological (medication) and psychosocial (motivational) elements have been identified as measures that ensure people in prison are sufficiently motivated to initiate their recovery and a crime-free life back in the community.

Yet services for alcohol misusers are often placed within a wider 'substance misuse' remit – meaning a focus on illicit drugs. As will be shown, the development of the Integrated Drug Treatment System (IDTS) – the clue is in the name – from which prison-based treatment is derived in England, focused primarily on creating a treatment apparatus for dispensing methadone, an opiate substitute, used in the management of heroin dependency. From 2006-2014, I undertook studies examining the needs of people in prison in 20-30 prisons across England some of which formed the basis of academic papers (e.g. Sondhi & Day, 2012). These studies consistently found that whilst services were available for people in prison with alcohol problems, these were often what Duke (2005) described as "illusionary".

Detoxification was the main clinical response with a limited interface to psychosocial interventions. The author interviewed prisoners who admitted fabricating dependence to opiates rather than receive an alcohol detox. Psychosocial interventions largely comprised basic health education lectures delivered to bored participants. Yet there were beacons of

hope, with some prison treatment services recruiting highly motivated staff delivering interesting and innovative interventions.

Consequently, the need to assess and understand whether treatment was effective for people in prison with an alcohol problem became an important topic. I assisted in a review of the Through-the-Gate pilot in the North West of England that led to a feasibility study commissioned by National Health Service (NHS) England¹ which was later taken forward in partnership with Public Health England (PHE) and the Ministry of Justice from which this thesis is derived.

The goal of evaluating an intervention is to derive a causal treatment effect, which is the difference in outcomes between those exposed to the intervention (treatment group) and individuals unexposed (the control) to the treatment (Hernán, 2004) . Such approaches are hard to deliver in a prison environment (as well as having ethical considerations) and consequently, quasi-experimental methods have been developed to mimic randomisation without denying access to treatment (Hollin, 2008a). This thesis is concerned with establishing causality. That is, can we argue with a degree of confidence that exposure to treatment results in changes in offending behaviour? Specifically, does treatment for an ‘alcohol use disorder’ (AUD) in prison produce changes in reoffending compared to a control group who did not receive treatment? The reoffending rates of a cohort exposed to AUD treatment and leaving prison between 2013-14 will be compared to a control group matched using ‘static’ (e.g. age, gender, ethnicity, offending history) and ‘dynamic’ factors (e.g. employment, physical health etc.). Randomisation establishes “balance” in the treatment and

¹ Sondhi, A. (2016), Alcohol Treatment in Prison: Overview of Proposed Method, unpublished internal feasibility study for NHS England.

control groups such that both groups are similar in every way related to their condition or treatment. This may include socio-demographic characteristics (e.g. age, gender) or issues relating to their health or criminogenic needs (offending history, alcohol use severity etc.) In the absence of randomisation, quasi-experimental methods may be utilised for observational studies that aim to recreate the benefits of randomisation including approaches that derive and establish balanced treatment and control groups (e.g. Bärnighausen et al., 2017).

1.2 Aims and Objectives

The overarching aim of this thesis is to assess the effectiveness of treatment in reducing offending for people in prison with an AUD. Specific objectives are to:

1. Assess whether complementary quasi-experimental methods can be deployed for a binary treatment system and then for multiple treatments or ‘joint treatments’ (Hernán and Robins, 2020) contained within a treatment system (for example, clinical or psychosocial treatments). More generally, the thesis will comment on whether quasi-experimental techniques are an effective approach for a prison setting.
2. Contrast three treatment modalities: pharmacological treatment; psychosocial treatment that adheres to risk-need-responsivity (RNR) theory and all other forms of psychosocial intervention (PSI) in order to understand the validity of each approach within settings that span criminal justice and public health settings.
3. Consider the advantages and limitations of these approaches in establishing causality?

4. Investigate reasons for differences in treatment effects across three treatment arms relative to a control group (pharmacological-only; psychosocial; Risk-Need-Responsive).
5. Examine practical implications of delivering treatment in a custodial setting.
6. Describe future applications of quasi-experimental methods in criminal justice settings.

1.3 Contribution to the field

The use of quasi-experimental techniques to evaluate interventions that span public health and criminal justice settings have increased substantially (Sweeten, 2017). The majority have been used for assessing the effectiveness of offender behavioural treatments that deploy cognitive approaches aimed specifically at reducing reoffending (either in the prison or in the community). A small number of studies have used quasi-experimental techniques in the substance misuse arena and fewer still that specifically examine the effectiveness of treatment for individuals diagnosed with an AUD (Hillier and Mews, 2018; McSweeney, 2015; Needham et al, 2015). The small number of studies reflects the fact that whilst the science has been developed for quasi-experimental techniques such as propensity score matching (PSM) for some time (Rosenbaum and Rubin, 1983), the software capability has lagged behind. Advances in software such as STATA (Stata Corp, 2017) have emerged over the last few years to support the theoretical principles advocated in the literature. Furthermore, the ability to undertake an analysis of multiple treatment components has only relatively recently been

made fully functional in software. A literature on examining a treatment effect in this context remains sparse as a result.

The thesis will also consider the validity of quasi-experimental methods to assessing effectiveness of multiple treatments within a single treatment system. Here, techniques will be deployed that use regression-based methods as a supplement to understand the contributions made by different treatments in reducing reoffending post-release. These are based on developmental work by Imbens (2000) and Lechner (2001). It is hoped that this will help provide nuance to understanding ‘what works’ for treatment for people with an AUD. It is hypothesized that there is no single silver bullet that leads to reductions in reoffending following treatment but combinations or types of treatment that may be suitable for some individuals (but not all). It is hoped that this thesis will start “*dismantling*” the components that underpin substance misuse treatment (Prendergast, 2013: 8) into a deeper understanding of which approaches may be more effective for whom and when.

1.4 Note on Methodology

This thesis has examined the literature on use of quasi-experimental methods in determining a causal treatment effect. These works can be broken down into two broad overlapping areas that include understanding the theory behind causal inferences, and a second describing the statistical foundations of deriving a control group to calculate a treatment effect. For the researcher, whilst this is useful context, these textbooks rarely help with the practical aspects of creating the samples, selecting variables that may be associated with treatment engagement and recidivism, and more importantly, what to look out for in assessing whether the treated and control groups are comparable. Whilst also true for randomisation studies, these texts can

be rather vague (as in the example below talking about ensuring comparability between treated and untreated groups, the most fundamental aspect of deriving a treatment effect):

“we must hope that our expert knowledge guides us correctly to collect enough data so that the assumption is at least approximately true”

(Hernán and Robins, 2020: 29)

The academic literature on causal effects is dominated by economics (e.g. Heckman, 2008) and medicine (e.g. Austin, 2008) with some, but rather limited, discussions in substance misuse and criminal justice domains (e.g. Sweeten, 2017). Consequently, this thesis has focused on the methodological discussions and practical application of methods derived from medical statistics and in particular the work of Peter Austin on technical aspects of propensity score matching (Austin and Mamdani, 2006; Austin, 2007; 2008; 2010; 2011; 2014; Austin and Stuart, 2015). The literature on deriving a treatment effect is much more limited for the reasons described above, with a technical paper by Linden et al. (2016) comparing the use of regression-based methods forming the basis for this thesis. This has been supplemented by the Stata’s web blog² which includes discussion forums which have been invaluable. It is hoped that this thesis will contribute to their work. Furthermore, the approach has been refined and developed by personal communication with individuals across government departments (e.g. Public Health England and Ministry of Justice). This has allowed the discussion and testing of assumptions underpinning the approach used in this thesis and has proved invaluable throughout the process.

² <https://blog.stata.com/2015/07/07/introduction-to-treatment-effects-in-stata-part-1/>

1.5 Note on Definitions and Terminology

The use of the term ‘causal treatment effect’ is one that has become more mainstream in scientific discourse (Pearl and Mackenzie, 2018). Pearl and Mackenzie (2018) describe how Sir Francis Galton and then Karl Pearson expanded our understanding of calculating statistical associations, but also expunged causality from the researcher’s vocabulary. The authors’ comment that this has “*inflicted causal blindness on itself, with far-reaching effects of all sciences that depend on data*” (Pearl and Mackenzie, 2018: 18). Although the papers reviewed for this thesis are explicit in the use of ‘causality’ within the context of observational studies to derive a treatment effect, there remains concerns that only randomisation can truly infer causality. Consequently, I will defer to Pearl and Mackenzie’s more cautious definition of determining “*provisional causality*” (Pearl and Mackenzie, 2018: 150) from observational studies for this thesis.

The provisional causal treatment effects were measured across two treatment levels. For the whole treatment system this will be referred to as ‘binary treatment’ indicating an either-or of treatment compared to no treatment. Three treatments will be further evaluated in this thesis. I have used the term ‘multiple treatments’ to describe these groups. The terms ‘substance misuse’ and ‘drug and alcohol misuse’ will be used interchangeably throughout this thesis. This is usually in the context of services or treatment systems that do not distinguish between illicit drug misuse and AUDs. I will explicitly use the term ‘AUD’ when referring specifically to alcohol-related issues. Finally, prisoners will be referred to as ‘people in prison’ to avoid use of the stigmatising term ‘prisoner’. ‘Offenders’ will be used when describing other criminal justice populations such as arrestees or those on a community sentence.

The thesis is structured over eleven chapters. Chapter Two will present an overview of the English prison system and how the substance misuse treatment system sits within a custodial setting. These systems will be framed within the wider substance misuse and reoffending policy contexts. Here, government policy will be reviewed in the context of substance misuse services generally, and specifically in relation to AUDs. The chapter will also provide an overview and working definitions of what comprises ‘treatment’ and ‘alcohol use disorders’. Chapter Three will examine the extent and nature of AUDs in the criminal justice system by examining the role that alcohol plays in offending including the extent to which AUDs are prevalent in prison settings. Chapter Four assesses the evidence from reconviction studies (e.g. rates of reconviction post release from a custodial setting). Chapter Five will present the main theoretical frameworks that explain how people in prison stop from engaging in criminal activities (or otherwise) post-release from prison with a focus on three concepts: desistance, recovery and unpacking the ‘black box’ of effective treatment. The sixth chapter includes detail on qualitative interviews that were undertaken with a small sample of operational and strategic stakeholders that describe how AUD treatment is delivered in practice in custodial settings. Chapter Seven introduces the problem of deriving causal inferences from existing studies into treatment effectiveness and the inherent biases explicit in the research literature. Chapter Eight presents an overview of theory behind the quasi-experimental methods for observational studies deployed in this thesis. Chapter Nine describes in detail the study design, measures and procedures including how disparate datasets were created and linked. The penultimate chapter will present results from the quantitative methods with a final chapter discussing the implications of the findings for clinical practice and for future treatment effects research.

Chapter 2: Overview of Government Policies and the Treatment System within a Custodial Setting

2.1 Prison System Overview

There are 120 prisons (103 male, 12 female and five for young offenders aged less than 18 years) holding 92,400 people in prison as of May 2019 in England and Wales (Sturge, 2019), and of these 106 are managed by HM Prison Service with 14 contracted to private companies. This prison population as of 2019 (compared to 2010) has been shown to be ageing with an increase in the over 50 age-group at the expense of under 21 year olds; people in prison are more likely to be in receipt of longer sentences (more than four years) with an overrepresentation of black and minority ethnic populations (Sturge, 2019). Female representation in the prison remains low at 5% with foreign nationals making up around one in ten of the prison population (11%). Violent offenders are the largest block of convicted people in prison at over one-quarter (26%) of the prison population (Sturge, 2019). Moreover, the official statistics suggest that 62% of all prisons in England and Wales were classed as overcrowded (Sturge, 2019).

A person in prison is allocated by the level of risk posed by that individual, with Category A being the most secure, and Category D offering “open” conditions including ‘home leave’ such as Release on Temporary License. Category B prisons take people on remand and directly from the court system prior to adjudication, with Category C (designated “trainer” prisons) taking people in prison toward the end of their sentence who are unlikely to escape but have not been designated Category D status. All prisons are commissioned to have a

treatment system treating drug and alcohol needs comprising clinical and psychosocial components which will be discussed in more detail below.

The implications of the changing prison population on offender health has been discussed. Sturop-Toft et al. (2018) argue that changing sentencing patterns that create an older prison population with increased health and social care needs will have profound effects on the nature of treatment in custodial settings. There may be situations where treating older people in prison may come at the expense of supporting those with substance misuse needs. These issues are discussed in more detail in Section 2.3 below.

2.2 The Role of Treatment in the Criminal Justice System

In a prison context, rehabilitation arose around the turn of the 20th century with the growth of disciplines such as psychiatry, psychology and criminology. Post-World War II, the introduction of the welfare state allowed these disciplines to ‘cure’ offenders, but there was a paradigm shift from the 1970-1980s when interventions based in prison became perceived as ineffective as part of a ‘nothing works’ agenda (Hollin, 1999). An influential review (Martinson, 1974) was hugely critical of previous studies that suggested treatment can be positively associated with reduced reoffending levels. Subsequent assessments of the evidence-base argued that there were wide variations in the effectiveness of treatment (Adams, 1976) with some interventions considered partially successful (Palmer, 1978). To that extent, Martinson refined his thinking to conclude that some interventions were promising, others were neutral and had no effect, whilst some were harmful (Martinson, 1978). However, the notion that treatment was ineffective had taken root within policy within sections of the UK. The apotheosis of this shift was the 1991 Criminal Justice Act enshrining

‘just deserts’ by emphasising the gravity of an offender’s crime rather than rehabilitation (Hudson et al., 1994).

By the 1990s, the development of statistical meta-analyses (aggregation of findings across a range of studies) offered greater predictive power to understand the extent and nature of reoffending, and an opportunity to reassess the effectiveness of interventions to reduce recidivism. This established a ‘what works’ paradigm (Andrews and Bonta, 1990) that suggested that treatment was effective, at least to some degree. A meta-analysis (Andrew et al., 1990) found that delivery of treatment reduced reoffending whilst criminal sanctioning without treatment had no effect ($r=-0.07$ suggesting marginally increased reoffending). Moreover, the study showed that reoffending rates declined more sharply ($r=0.30$) if it included ‘appropriate’ treatment (incorporating behavioural components) than not (including coercive measures only, $r=0.13$). This finding has been echoed in a UK context by Marsh et al.’s (2009: 141) meta-analysis analysing substance misuse treatment suggesting that “...*treatment in prison reduced reoffending when compared with just prison*”. Andrews et al. (1990) also highlighted the contextual effect for treatment as important explanatory factors, such that interventions in the community had greater impact than those in custodial settings.

So, what had occurred from the 1970s to the 1990s? Had interventions and treatment programmes suddenly become more effective? Rather it was suggested that these changes were due to improvements in how we measure effectiveness. Lipsey’s (1992) meta-analysis of juvenile delinquency treatment programmes argued that ‘nothing works’ was purely a statistical artefact caused by a ‘distribution effect’ resulting from amalgamating interventions. If one examined individual programmes, some demonstrated large and significant effects which were ‘lost’ through the accumulation of interventions. Meta-analyses across various

criminal justice domains continued to proliferate with scores of studies being included comprising much larger sample sizes combined with enhanced statistical techniques that eventually concluded that treatment has at least some effect on recidivism. By the turn of the 21st century, a reemphasis on treatment and rehabilitation started to emerge in the wake of promising meta-analytical findings leading to ‘restorative justice’ approaches that aimed to balance punishment with treatment (Kratcoski, 2017).

The return of treatment as an effective mechanism to address reoffending was highlighted in meta-analyses of drug and alcohol treatment. Holloway and Bennett’s (2016) meta-analysis highlighted the combination of medication and psychosocial interventions that were shown to have the largest and most consistent effects for substance misuse treatment. Weisburd et al. (2017) reflected that successful interventions addressing substance misuse were notable as they rarely were pure crime reduction initiatives but focused on wider ‘social’ benefits of treatment such as treating addiction. Holloway and Bennett (2016) explain this by highlighting the indirect nature of drug and alcohol interventions - reductions in reoffending facilitated by substance misuse treatment are a consequence of reducing drug or alcohol consumption. However, whilst Bennett and Holloway were unequivocal as to a treatment effect (“*the analysis suggests that drug treatment is effective in reducing offending*” [p627]), other reviews have suggested that within a prison context opiate-based maintenance may be considered “*ineffective*” to reduce reoffending (Barnett and Howard, 2018: 122) as clinical interventions focus on a medical aetiology which may not directly address criminality (Farabee, 2018). This issue will be discussed in more detail in this thesis.

The ‘what works’ agenda filtered through to more receptive ears by the turn of the 21st century which can be shown to link to the wider political climate of the time. The Social

Exclusion Unit study (2002) highlighted the absence of effective service provision in prison with the need to respond to the drivers that underpin crime, and explicitly drug and alcohol misuse. A change in government in 2010 however, did allow for a return of the ‘nothing works’ scepticism which was neatly encompassed in the ministerial foreword to the consultation Green paper *Breaking the Cycle* suggesting that prior to 2010, prison was merely “...an expensive way of giving the public a break from offenders, before they return to commit more crimes” (Ministry of Justice, 2010a; p1).

2.2.1 Defining Alcohol Use Disorders

An AUD has been defined as “a chronic relapsing brain disease characterized by compulsive alcohol use, loss of control over alcohol intake, and a negative emotional state when not using³”. Specifically, an AUD falls within the Diagnostic and Statistical Manual of Mental Disorders (DSM) version 5 or DSM-V. Under DSM–V a person must meet at least two of the 11 criteria within a 12-month period to receive a diagnosis of AUD. The severity of AUD is between ‘mild’, ‘moderate’, or ‘severe’ forms as is based on the number of DSM-5 criteria met. For many services, use of screening tools such as the Alcohol Use Disorder Identification Test (AUDIT) have been developed that categorise drinking into categories based on the severity of problematic drinking (Bush et al., 1998).

However, it should be noted that access to prison-based treatment services may not be based on ‘clinical’ measurements of DSM-5 indicators. People in prison may be compelled as part of their sentence plan to receive treatment if alcohol was perceived to be a contributory factor in their offending. This results in a binary view of drinking that may over- or under-state their

³ <https://www.niaaa.nih.gov/alcohol-health/overview-alcohol-consumption/alcohol-use-disorders>

dependence on alcohol. For this thesis, the definition of whether a person in prison had an AUD was dependent on the risk assessment undertaken by their offender manager. Later chapters will discuss the implication of using this approach as it does not equate to clinical diagnoses with DSM-V or alternative approaches derived from AUDIT. Although this can be viewed as a subjective perspective from an offender manager, this may have benefits in establishing direct links between alcohol consumption and offending.

2.2.2 Defining “Treatment”

The term “treatment” has been used interchangeably depending on who pays, delivers or who researches it. Definitions of treatment can also be country specific, such that alternate descriptions can differ if you are based in the UK, North America, Europe and Australia. Treatment can encompass ‘medical or clinical’ interventions (usually pharmacological approaches) and for this thesis the term ‘pharmacological’ treatment will be routinely used. In the UK, prison-based treatment include structured approaches that use of pharmacological interventions to treat alcohol misuse to promote abstinence or prevent relapse (Department of Health, 2017; 2006; Public Health England, 2014; National Institute for Clinical Excellence, 2011). Structured PSIs are “*delivered as part of a client’s care plan, which assist the client to make changes in their alcohol misuse*” (Public Health England, 2014: p20) and other structured interventions that include a range of possible therapeutic activities between keyworker and client. By way of comparison, offender behavioural programmes (OBPs) which have been rooted in North American literature (Bonta and Andrews, 2010), deploy cognitive, psychosocial techniques (encompassing motivational interviewing and cognitive behavioural therapies) and have been developed for the purpose of crime reduction. An OBP can fall within a ‘general offending’ and crime-specific remit and is based theoretically on

risk-need-responsivity (RNR) which will be discussed in more detail below. Underpinning behavioural programmes are a prescriptive, manualised approach that relies on a strict adherence to what and how programmes are delivered. Psychosocial interventions may be used in a similar capacity (e.g. similar content) but not form part of an OBP in that it will rarely be fully manualised and will not aim to adhere to RNR precepts. PSIs may be considered more flexible than manualised OBPs to include any ‘talking therapy’ and can comprise a range of cognitive approaches. As will be shown, a ‘medical/clinical’ model of treatment has emerged revolving around the provision of pharmacological support provided by health practitioners funded by health-related bodies. OBPs have focused on non-medical interventions that examine the behaviour of an offender, funded by criminal justice agencies (e.g. government departments with responsibility for crime) and historically delivered directly by prison services.

In England and Wales prior to 2000, the focus on offender rehabilitation was through off-the-shelf OBPs. After 2000, clinical treatment (also offering pharmacological interventions) was introduced across the criminal justice system as part of the burgeoning ‘what works’ agenda (Marteau et al., 2010). During this time, the delivery of medical or clinical interventions was commissioned by the National Health Service (NHS), with OBPs under the purview of the Home Office and later the Ministry of Justice. This created an artificial divide whereby pharmacological treatment and OBPs were provided for under separate funding and governance regimes. Commissioning arrangements changed as the Integrated Drug Treatment System (IDTS) altered the pharmacological/OBP divide (see below for a more detailed discussion). With greater primacy of National Health Service (NHS) commissioning, the distinction between pharmacological treatment and OBPs became blurred, as the delivery of OBPs were subsumed within new contractual arrangements that encouraged a mixed delivery

model, with NHS medical services often delivered in partnership with third-sector services (Kalk et al., 2018).

Consequently, the term “*treatment*” encompassed pharmacological interventions as well as OBPs. It is contended that OBPs and all other forms of treatment have been merged into a single concept encompassing any pharmacological or psychosocial intervention (manualised or otherwise). This also reflects the commissioning perspective of what treatment in prison is expected to deliver (see Section 2.3.2 below). This blunt and all-encompassing definition creates a problem when deriving a treatment effect within a treatment system. It assumes there is a single approach to treating offenders with little variation. As will be shown in later chapters, this description of offender-based treatment is not entirely accurate, with some variations in how treatment has been operationalised to create local approaches. The components of an effective treatment response may be contained within a treatment arm or a specific intervention type. This thesis will attempt to use quasi-experimental techniques to disentangle possible effective interventions that specifically reduce recidivism. Whilst OBPs remain in theory an option for other non-substance misuse forms of offending, most ‘clinical’ services have been augmented by psychosocial interventions as we shall see later in this chapter. For this thesis, the concept of ‘treatment’ will assume an integration of pharmacological treatment, PSIs and substance misuse specific OBPs.

2.3 Treatment for Substance use and AUDs within the English Prison System

The development of the ‘what works’ agenda and statistical meta-analyses in criminal justice rehabilitation coincided with publication of research detailing the role of clinical community-based treatment as a means to reduce criminal activity across English-speaking settings (Sells

and Simpson, 1980; Simpson et al., 1986; Simpson et al., 1997). A pivotal and highly influential study was the National Drug Treatment Outcome Study (NTORS)⁴ that followed 1,100 drug users into community-based treatment (Gossop, 2015). Drug treatment comprising pharmacological and psychosocial support demonstrated such significant positive outcomes (Gossop et al., 2003a; Gossop et al., 1997) that the UK government triumphantly concluded that ‘treatment works’ (Department of Health, 1996). Despite this success, the NTORS authors noted weaker results for drinkers (Gossop et al., 2003b) that had profound implications for treatment services (Gossop, 2015). The analysis of the NTORS cohort provided essential UK evidence for the cost effectiveness of treatment to reduce criminal activity (Gossop et al., 2005; Godfrey et al., 2004; Gossop et al., 2000; Gossop et al., 1998a; Gossop et al., 1998b). These savings were helpfully quantified – for every pound spent on treatment, saved a further £3 from reduced levels of crime (Gossop et al., 2000). The National Treatment Agency – created as a quango in 2001 - was empowered to deliver and widen a ‘treatment works’ paradigm. Here, treatment was a panacea for all people, in all contexts and at all times (Bean, 2014).

From a criminal justice perspective, a key study (the New England and Wales Arrestee Drug Abuse Monitoring Programme, later the Arrestee Survey) examined the link between crime and substance misuse among offenders known to police custody (Boreham, 2007). The study highlighted significant correlations between drug use and acquisitive crime (‘trigger’ offences) and poor levels of treatment engagement. Although there has been commentary on the methodological efficacy of this study and NTORS (Stevens, 2008; Ashton, 1999), the findings were used to justify links between substance misuse and crime and develop a

⁴ NTORS led to related observational studies in Scotland (DORIS) and Ireland (ROSIE) which are discussed in Chapter Seven.

treatment response to meet this need. The criminal justice system therefore was seen to offer an opportunity to divert offenders into specialist addiction treatment which would deliver NTORS-style crime reductions (Oerton et al., 2003; Kothari et al., 2002).

Yet, it should be noted that the Arrestee Survey (Boreham et al., 2007) found higher levels of problematic drinking among this population of offenders, with over half (57%) reported to be drinking at dependent levels; 38% stated they committed acts of violence after drinking and with 3% stating they were in treatment for an AUD (compared to 30% for heroin users) and only 17% ever being offered treatment (compared to 62% of heroin users). The possibility of NTORS-style reductions in crime was partially realised through an examination of reoffending as part of the Drug Intervention Programme. These interventions based on direct referrals from police custody were able to demonstrate broad reductions in offending, although this was not true of all categories of offender (Skodbo et al., 2007).

The importance of access to drug and alcohol treatment was consequently enshrined as one of the seven pathways to reducing reoffending defined in the *Reducing Reoffending Action Plan* (Home Office, 2004), across England and Wales⁵. Yet as suggested, Government Drug Strategies have been overwhelmingly dominated by a response to illicit drug misuse, with offending associated with alcohol consumption relegated to a footnote. Provision of services and interventions for AUDs across the criminal justice system during the last 20-25 years had no strategic oversight at the Home Office, or central funding, and any strategic documents tended to be published after those for illicit drugs with remarkably similar content. The strategic policy direction that did finally emerge (National Offender Management Service,

⁵ Due to the devolved nature of government, Scotland and Northern Ireland has its own drug strategy.

2006) had a familiar feel with its emphasis on identification and directing offenders into treatment.

Despite the need to support offenders with AUDs, policy and interventions remained geared towards drug misuse and were aimed at expanding the reach of treatment within opiate and/crack-using populations (Malloch and McIvor, 2013; Rungay, 2003). Government policy emphasized: “...*offenders are encouraged to seek treatment and recovery at every opportunity in their contact with the criminal justice system*” (HM Government, 2010: 12), the emphasis on substance misuse was for illicit drug use and opiate or stimulant use rather than alcohol.

The emphasis for funnelling offenders into specialist treatment services coincided with significant uplifts in investment overseen by the National Treatment Agency whose existence was predicated around increasing treatment capacity. However, there has been debate as to the government’s motivation for diverting offenders into treatment. For some, there was a shift from a public-health, pragmatic approach dominated by a medical-disease model view of addiction, towards a more punitive ‘criminalisation’ or ‘criminal justice turn’ which has been viewed as a politically-driven ‘assault’ on an underclass who disproportionately tend to be substance misusers (Monaghan and Yeoman, 2016; Seddon et al., 2008; Hunt and Stevens, 2004). This argument is based on the view that the criminal justice system regulates or manages the poor as a means of social control rather than dealing with social injustice such as poverty (Rodger, 2012; Seddon, 2000). Medical treatment is thus an adjunct to punitive social control policies by advocating treatment as a ‘cure’ for offenders as part of a ‘bad and sick’ or a ‘medicine with morality’ duality (Tiger, 2013; Shiner, 2013).

For Hunt and Stevens (2004), this implied a shift from treating harm *to* drug users towards managing harm *committed by* drug users. Stimson (2000: 259-260) argued that Britain's once 'healthy' policy was supplanted by a "war" and "*the introduction of a punitive and coercive ethos*" that Seddon suggests would be "*profoundly shocking to an historical observer*" (Seddon et al., 2008: 818). This may be hyperbole or as Matthews and Young (2003: 22) suggest "*overdrawn*" as the proportion of referrals that could be mandated is a small number of all referrals to treatment (Public Health England, 2020). Moreover, Shiner (2013) argues that the criminalisation hypothesis is too simplistic, and "*misses the point*" (Shiner, 2013: 639) in that the criminal justice system has become more punitive. The author concludes by stating:

"The medico-penal alliance that was forged a century or so ago remains firmly in place and it is this hybrid arrangement, with all its attendant tensions and contradictions, that is, perhaps, the most distinctive and enduring feature of British drug policy" (Shiner, 2013: 640).

Commentators highlight the continuation (or reframing) of the relationship between substance misuse and the criminal justice system (Shiner, 2013; Duke, 2006) where the UK drug and alcohol policy was "*less medical than it seemed*" with the British system's famous pragmatism based on "*a mixed criminal justice and medical system of control in which the balance of power could alter in response to the changing patterns of addiction*" (Berridge and Hickman, 2007: 479). As Shiner suggests, the curious use of militaristic rhetoric ('war' or 'assault' on drug users) may be too polemical and unidimensional, reflecting a specific political point in time at which these comments were made. Fischer et al. (2017) argue that whilst prisons intrinsically perceive addiction as part of moral deviance or 'criminal careers'

which will affect the nature of interventions offered to prisoners, prison-based treatment suffers from a lack of resourcing and the stigma underpinning prisoners' refusal to accept support. Yet, the role of alcohol within this debate remains nebulous. Alcohol, as ever, remains outside the scope of most discourse around 'substance' use and misuse.

Furthermore, one needs to be cognisant of the influence of the 'what works' agenda, and the government's transposition of idealised NTORS-level crime reductions that treatment was seen to offer through funnelling offenders into treatment. It can be questioned how 'healthy' treatment was at the time if you were unlucky enough to be a person in prison, as the early-1990s 'just deserts' agenda advocated punishment at the expense of rehabilitation (which included 'cold turkey' for drug and alcohol misusers experiencing withdrawal in prison)⁶. There is also little cognisance of the actual experiences of offenders trying to access services at that time. For example, the negative experiences of offenders who received community-based treatment resulted in wide disparities in the engagement rate for different offender segments (Sondhi et al., 2002) in part due to perceived idiosyncratic service provision and a view that offenders were considered 'undeserving' of clinical or social support⁷.

Concepts of 'recovery' from dependence became official policy from 2010⁸ with an emphasis towards abstinence (or 'free from dependence') as a defining position (Monaghan, 2012).

Concepts of recovery which began in the mental health arena have been used to describe abstinence from substance use (Laudet and White, 2010; Rudolf and Watts, 2002) but have

⁶ For a detailed discussion of healthcare services in the 1980s and 1990s see <http://history.lshtm.ac.uk/2017/09/11/hiv-aids-prisons-england-wales-1980s-1990s/>

⁷ In an unpublished internal scoping study of police diversionary services for the Home Office (2002), I describe the perceptions of a small sample of offenders' (n=12) experiences of community treatment. Offenders described negative treatment experiences where services created what was perceived as cruel, arbitrary and unfair barriers to access treatment that worsened addiction/withdrawal symptoms and raised overdose risk, alongside hostile attitudes from some treatment agency staff.

⁸ Although it became part of the Scottish Government's agenda in 2008.

increasingly recognised and accepted managed use (Laudet and White, 2010). Recovery has increasingly been placed within a ‘general wellness’ description (Hser, 2007; Rudolf and Watts, 2002), where an individual manages use of drugs or alcohol, whilst addressing other social needs such as housing or employment (Timpson et al., 2016; Betty Ford Institute Consensus Group, 2009; Laudet, 2007). The concept has also however, been conceptualised as a continuation of the perceived ‘assault’ against the under-class (Monaghan and Yeoman, 2016). Recovery within the criminal justice system gained traction among policy thinkers through critical coverage of the role of addiction treatment within prison. Studies by several influential think tanks suggested that people in prison were ‘parked’ on substitution medication (mainly but not entirely, methadone for illicit heroin use) due to a fear of litigation (Centre for Social Justice, 2015; Chambers, 2010). In addition, these politically orientated organisations argued that the managerialism brought in by the previous Labour government had undermined professionals’ ability to enforce change:

“psychosocial treatment and case management teams...characterised by bureaucracy, box-ticking and poor targeting...The distribution of programmes is illogical and too much money is spent on low-threshold, low-intensity programmes which are unlikely to make any real difference to severely dependent addicts with ingrained lifestyles.” (Chambers, 2010: 8).

The Conservative government’s drug policies have been shown to be confused, unclear and contradictory (Watson, 2013) leading to ‘false dichotomy’ between harm reduction and abstinence-based recovery (Kalk et al., 2018). It is a working hypothesis for this study that instead of policy being an assault against drug users, political battle lines have been drawn, where Conservative commentators aim to rebut the previous administration’s legacy.

Recovery, therefore, has become politicised as a surrogate for abstinence and from receiving

long-term pharmacological interventions. For these think-tanks⁹, abstinence-based treatment (meaning no medical substitution) was the sine qua non for recovery. Yet, it is instructive to note that in these two prison-specific think-tank studies (Centre for Social Justice, 2015; Chambers et al., 2010), outside of footnotes, alcohol was mentioned only four times, suggesting for these think-tanks problematic alcohol misuse remains stranded in no-man's land. Recovery for offenders and people in prison with an AUD has also not been operationalised, with an assumption that what works for illicit drug users will automatically convert to alcohol treatment.

'Recovery' was showcased in the *Putting Full Recovery First* document (Home Office, 2012) that stated people in prison were to be stabilised, detoxified and taken-off substitute medication before release back into the community alongside the need for effective continuity-of-care¹⁰. Yet clear tensions across Whitehall emerged as the Department of Health subsequently stated that "...there should be no mandatory requirement of reduction as a precondition for placement on [a Drug Recovery] wing." (Department Health letter dated 9th January 2012). The impact on treatment models resulting from changing political discourses on recovery/abstinence, changing commissioning arrangements towards a wholly health-based approach (discussed below) and cuts resulting from financial austerity remain to be fully evaluated across criminal justice settings. It is beyond the scope of this thesis to unpack these issues in detail but rather highlight the context in which substance misuse treatment has been developed. Despite politicisation of the substance misuse treatment agenda, it has been argued that the 'British system' of pragmatism has been maintained

⁹ Such as the Centre for Social Justice, Policy Exchange etc.

¹⁰ The exact wording is "Revised clinical guidance set clear expectations that unless there are clinical reasons to the contrary, prisoners spending any significant period in custody will be stabilised, safely detoxified and released into the community drug free" (Home Office, 2012: 25)

through its ‘criminal justice turn’ and imposition of ‘recovery’ as a strategic ideal, suggesting that a public health emphasis has been “*carried on and expanded [upon] in actual practice*” (Stevens, 2010: 83).

2.3.1 Government Strategies: ‘doing the same thing over and over again and expecting different results’

Within this context, there have been several Government strategies aimed at addressing drug and alcohol misuse among offenders. Two themes will be shown to be consistent. Broadly speaking and despite the politicisation of addiction treatment, the strategies represent a continuation of thinking and approaches across administrations despite the rhetoric. The previous Labour administration’s aim of funnelling offenders into treatment remains a constant theme within all Conservative policy initiatives, alongside continuity-of-care post release to maintain contact with people in prison to reduce re-offending. The second theme suggests that the focus of these strategies has been and continues to be illicit drug misuse, with provision for alcohol services largely an afterthought and conveniently placed under ‘substance misuse’ rather than deserving consideration on its own merit.

For England and Wales, the Government’s 2010 and 2017 Drug Strategies (HM Government, 2010; 2017) placed a continued emphasis on the role of offenders’ access to treatment at all stages of the criminal justice system, underscored by publication of The Patel Report (Department of Health, 2010). This review of prison-based treatment for substance misusers emphasised the need to place rehabilitation and public health as synergistic strands of one overarching strategy that links prisons to the wider community. The 2010 Strategy also explicitly included treating AUDs as a strategic goal alongside illicit drug misuse. In a specific prison context, *Transforming Rehabilitation*, (Ministry of Justice, 2013) restated

continuity-of-care for released people in prison as an explicit mechanism to reduce reoffending which was to be achieved via a '*Through-the-Gate*' approach that linked prison services to the community. Although this was presented as a radical new conceptual design, this approach is remarkably similar to the previous administration's development of the Drug Intervention Programme. This initiative aimed to achieve precisely the same outcomes, by ensuring offenders receive an 'end-to-end' programme of support and access to treatment throughout all points of the criminal justice system via a single point of contact and a case-managed approach initially called the 'Criminal Justice Intervention Teams' (Home Office, 2009). Yet despite this degree of apparent continuity as a policy, an 'Inspection of Through-the-Gate Resettlement Services for Short-Term Prisoners' by HM Inspectorate of Probation and HM Inspectorate of Prison (Criminal Justice Joint Inspection, 2016) found issues in the delivery models used by prisons to ensure continuity of care, with only the most basic resettlement approaches (e.g. referrals) being used despite extra resources being made available to encourage innovative approaches. A critique of the 'Through-the-Gate' model argued that management of offenders heightened the bureaucratisation of the model that bypassed a "*human service*" required to develop meaningful and therapeutic relationships (Maguire and Raynor, 2017: p151).

Continuity-of-care was to be enhanced in *Transforming Rehabilitation* by enabling access to newly-created supervision and rehabilitation services (privatised Community Rehabilitation Companies [CRCs] for low-medium risk offenders; or the National Probation Service for high-risk offenders) for a period of 12 months for all people in prison released from short custodial sentences of up to two years. Resettlement prisons (Category C prisons) would also provide access to support services in the community in the last three months of their sentence prior to release.

Yet there is little in the policy documents that specifically addresses services or interventions for people in prison with an AUD, as these are subsumed within drugs or substance misuse services, embedding the assumption that treating people in prison for drug dependence will be identical as those with an AUD. Changes made to license and supervision arrangements as part of *Transforming Rehabilitation* were for illicit drug users, not for people in prison with an AUD. Many of these new requirements fell within the *Offender Rehabilitation Act, 2014* (HM Government, 2015) that mandated access to treatment and a drug testing regime for Class A or B illicit drug users (again echoing previous approaches forming part of the Home Office's *Tough Choices* strategy ten years prior). It is worth noting that people in prison with an AUD and who are not a Class A or B drug users were not eligible for mandated treatment under this legislation.

Important to note was the change in community sentencing and supervision in 2014, where serious cases were split into the National Probation Service and less serious cases forming the workload of 21 CRCs owned by eight private service providers. The newly formed CRCs were expected to extend supervision to all people in prison on release (prior it was just for people in prison sentenced for more than 12 months). Once in the community and under CRC supervision, offenders will be risk assessed and anyone identified as having an AUD will be referred to community-based treatment. In May 2019, the Government announced the end of the outsourced CRC model and a single, unified system was brought back into public control from 2021. Despite these changes, the operational model remained largely untouched with an aim of strengthening supervision on release and enhancing through-the-gate support (although it remains unclear what this will entail)¹¹.

¹¹ Ministry of Justice <https://www.gov.uk/guidance/strengthening-probation-building-confidence> downloaded 28th February 2020.

During this time, the Ministry of Justice also published *Prison Safety and Reform* (2016a) aiming to improve services on offer in prison and to enhance outcomes of people in prison released into the community. This strategic document focused on the need to address use of new/novel psychoactive substances within prison as an immediate ‘crisis’ (Duke, 2019), but also enhancing pathways to and from prison treatment (including once again, linkages with the community) including developing a greater understanding of the impact of dual diagnosis (the interaction between substance misuse and mental health). A thematic review by HM Inspectorate of Prisons on substance misuse services (2015) again re-stated the view that for treatment to be effective and without directly mentioning recovery, prison-based interventions needed to consider holistic links to other services encompassing mental health, employment and housing. Where these linkages were not achieved, treatment performance was effectively undermined (HM Inspectorate of Prisons, 2015). These documents place AUDs within ‘substance misuse’ interventions and alcohol mentioned specifically only once in the whole document (only in relation to dual diagnosis).

In 2016, the *Prison and Court Reform* Bill was introduced to convert six prisons into ‘reform’¹² prisons alongside the opening of an additional prison (HMP Berwyn). This legislation allowed for prison governors to have some autonomy over their budgets to create a co-commissioning model with NHS England in the delivery of services.

Breaking the Cycle (Ministry of Justice, 2010) highlighted ‘Drug Recovery Wings’ as a response to the criticism that people in prison were maintained on medication, and that specific emphasis could be made to reduce prisoners’ reliance on pharmacological support whilst providing enhanced continuity-of-care post release. Despite being called ‘drug’ wings,

¹² HMP Coldingley, HMP Highdown, HMP Holme House, HMP Kirklevington, HMP Ranby and HMP Wandsworth

the criteria for admission did allow admission for people in prison with an AUD although it was unclear what interventions were being offered apart from generic descriptions of ‘clinical’ and ‘psychosocial’ interventions (Lloyd et al., 2017; Powis et al., 2014). Although there has been some evidence of good practice, major problems operationalising recovery that may tend towards a default to ‘business-as-usual’ services have been noted (Lloyd et al., 2017; Powis et al., 2014). This has been compounded by the absence of effective interventions to support recovery with prison-based interventions seen as broadly ineffective at maintaining or supporting recovery post-release (Lloyd et al., 2019).

2.3.2 Treatment for AUDs in Prison

This section will focus on treatment in a UK context that was contemporaneous to the period of data collection. Prior to publication of the strategic documents outlined above, specialist drug and alcohol services revolved around Counselling, Assessment, Referral, Advice and Throughcare (CARATs) teams that offered psychosocial interventions to illicit drug users based on a Risk-Need-Responsibility (RNR) model (Burrows et al., 2001) which is described in more detail in the next section. As with other OBPs, the intervention was overseen through a regular inspection and auditing regime, which has been criticised for its inflexibility and lack of coordination with external services to ensure effective continuity of care (Harman and Paylor, 2004). CARAT services (commissioned directly by Ministry of Justice) were unable to take on people in prison with an alcohol-only problem due to a focus on illicit drug use (Prison Service Order 3630, 2002), despite AUDs forming over a third (36%) of the total CARAT caseload (May, 2005). Consequently, services were criticised for ignoring people in prison with an AUD, especially those on short-term sentences (HM Inspectorate of Prisons, 2010; National Audit Office, 2008).

The development of treatment within the prison system was boosted by IDTS from 2010 (PSI2010-045 Integrated Drug Treatment System) so that, despite its name, provision was made for treating people in prison with an AUD. It was at this point pharmacological treatment and PSIs were officially merged within an idealised, integrated system (although OBPs were provided independently by the Ministry of Justice). IDTS evolved in response to successful legal challenges by people in prison who objected to a perceived ‘cold turkey’ policy of enforced unassisted withdrawal from drugs and alcohol, with the emphasis that there should be a principle of ‘equivalence’ whereby reciprocal arrangements are granted across community and prison services (NHS England, 2018). IDTS aimed to enhance the volume and quality of clinical interventions through screening and assessment processes at the point of arrival into a prison even if they were transferring from other prisons (Department of Health, 2006). This would be an issue for prisons that take people into prison straight from the community where alcohol problems may be undiagnosed or untreated.

Following the identification of alcohol-related problems, structured PSIs (of the type provided by CARATs) were to be provided during the first 28 days of any clinical intervention, and greater planning was required with community services post-release (Ministry of Justice, 2010). As with CARATs, IDTS was merged within new commissioned arrangements to ensure uniformity between community and prison-based services, so that in many cases one local treatment provider would offer interventions as part of the ‘Through-the-Gate’ approach, although this was not always achieved for a range of structural and operational reasons (Callanan et al., 2014). The delivery of treatment interventions as part of IDTS remained heavily focused on opiate addiction with services for alcohol misusers comparatively undeveloped (Callanan et al., 2014). Although CARATs and IDTS no longer operate as discrete entities, the principles for immediate access to clinical treatment and

subsequent health interventions have been enshrined within the ‘Orange Book’ clinical guidance (Department of Health, 2017).

The delivery of services for people in prison with an AUD form part of a five-way governance arrangement (HM Government, 2018) between The Ministry of Justice, the Department of Health and Social Care, HM Prison and Probation Services, NHS and PHE (with devolved arrangements for Wales and Scotland). The provision of services for AUDs were subsumed within a substance misuse definition, with interventions commissioned by regional NHS teams under this arrangement. Delivery models have been defined through a service specification (NHS England, 2018) that places substance misuse within a wider Offender Health pathway. The guidance documents also specify the principle of equivalence whereby prison-based treatment should be comparable to community provision (NHS England, 2018; Department of Health, 2017). Ethical concepts of equivalence of care have been enshrined in the United Nations’ Basic Principles for the Treatment of Prisoners (Ahalt and Williams, 2018). Some commentators have noted inconsistencies in achieving this equivalence of care in a custodial setting due to the increased size and complexity of the prison population (Ismail and de Viggiani, 2018a). Prison security concerns (threat of violence, use of illegal drugs etc.) have also been shown to impede access to healthcare through use of ‘lock-downs’ and other measures aimed to reducing interactions across the prison estate. In addition to limiting access to healthcare services, a lack of access to other purposeful activities has been noted. Commentators have argued that there is a causal relationship between reduced funding for prisons, overcrowding, degrading prison conditions and increasing levels of violence, self-harm and suicide (Ismail, 2019; Piper et al., 2019). Macro factors have also coincided with micro or cultural aspects specific to prison life. Ismail and de Viggiani, (2018b; 2018c) extend this argument to suggest that the prison Governors’

“unfettered discretion” (Ismail and de Viggiani, 2018c: 602) allied with a command-and-control, hierarchical management structure and an overarching suspicion of public health approaches will also further worsen the ambition of delivering genuine equivalence of care in prison healthcare.

The NHS-specified outcomes that have been established include ‘free from dependence’, ‘supporting recovery’ and ‘improved throughcare’ (NHS England, 2018). Reduced reoffending is mentioned as a rather vague aspiration but not as a direct outcome measure¹³. This is in part due to guidance from PHE supported by academics and practitioners that is unequivocal as to the benefits of drug and alcohol treatment in both the community and prison settings to reduce reoffending (Public Health England, 2017). Under this commissioning arrangement, prison healthcare services should be determined by local need, with commissioners empowered to have discretion in the range of services offered to people in prison so long as they are in harmony with national guidelines. Commissioned services should ensure access to pharmacological interventions to manage acute needs such as withdrawal and detoxification, alongside PSIs addressing AUDs and offending, including access to self-help groups such as Alcoholic Anonymous. Although no official data as to the nature of service provision is collected, services are dominated by a mixed model of collaborative third sector and NHS provision (Public Health England, 2018, personal communication). What is striking about all of the above documents is the absence of any direct reference to OBPs (behavioural interventions are subsumed within clinical activity).

¹³ The exact wording is *“a reduction in the likelihood of substance related offending should be a central aim of any treatment intervention and could add value for prisons to identify drug trends”* (NHS England, 2018: 14).

From a prison treatment perspective, Casey and Day (2014) suggest a broad prison-based substance misuse treatment services typology of harm reduction initiatives (largely aimed at disease transmission or overdose prevention); psycho-educational programmes; higher intensity group programmes; and prison-based therapeutic communities. It is likely that this characterisation of prison treatment services does not fully capture the health-focus of England and Wales interventions. Consequently, alongside themes of continuation of policy across administrations and the lack of direct focus on AUDs in favour of a generic substance misuse rubric, it is also a working hypothesis for this study that treatment interventions for AUDs in prison are heavily focused on treatment for health conditions rather than a focus on addressing criminogenic behaviour, with the assumption that these interventions will automatically translate to reductions in reoffending rates.

However, it remains unclear the extent to which commissioners have purchased services for people in prison with specific needs around AUDs. The commissioning of services has been considered ‘illusory’ in the absence of transparent funding arrangements for alcohol provision, with the quality of the offer available to people in prison dependent largely on the effectiveness of each agency (Duke, 2005). A review of commissioning intent of alcohol-specific interventions for offenders in both the community and in prison confirmed this fragmentary approach to treatment that was often under-resourced and subject to considerable local variations (Fitzpatrick and Thorne, 2011). It may be hypothesized that by placing alcohol as merely a subset of substance misuse rather than a developing unique and bespoke service, may create fundamental problems commissioning innovative services for people in prison with an AUD. Rather, commissioning of services may be the result of an inadvertent default to the status quo (‘business as usual’).

2.3.3 Treatment for Offending: Risk Need Responsivity

Whilst ‘treatment’ for AUDs may incorporate pharmacological and PSI components, people in prison may be offered psychosocial OBP that address attitudes and behaviours associated with an individual’s risk factors of reoffending. As highlighted in the preceding section, OBPs are largely (but not exclusively) North American focused. Andrews and Bonta (2010) have highlighted three principles that underpin effective OBPs aimed at offender rehabilitation and were identified from a meta-analysis of criminogenic factors that predicted the likelihood of reoffending. The first principle focuses on an offender’s likelihood of reoffending, such that higher-**risk** offenders are required to receive more intensive (e.g. a higher ‘dose’) interventions. The measurement of reoffending or criminogenic risk will differ from tools that measure clinical risk (such as diagnosing dependency or problematic substance use, and other clinical risks that affect a person’s health). Reliable and validated tools are implicit in the measurement of criminogenic risk. In a substance misuse context, Lowenkamp et al.’s (2005) meta-analysis of drug court programs found that high-risk populations were likely to reduce levels of recidivism by twice as much compared to low-risk groups.

In the UK, the Offender Group Reconviction Scale 3 (OGRS) is an actuarial tool established to predict general reoffending and is administered to people in prison across England and Wales (Howard et al., 2009). It incorporates three risk factors (age, gender and offending history) to derive the likelihood of reoffending 1-2 years from prison discharge and has been shown to have a high level of predictive accuracy (Howard et al., 2009). OGRS scores are broken down into three groups of low-medium-high-very high risk. Use of OGRS scores have been incorporated within a wider Offender Assessment System (OASys) that integrates

actuarial risk (e.g. using a statistical model to determine the likelihood of reoffending) with dynamic and static risk factors. The OASys needs assessment includes details of the offence, alongside measures of accommodation, employment/education/ training, financial, relationship, lifestyle/associates, drugs and alcohol, emotional well-being, thinking and behaviour, attitudes and general health needs.

The second principle is to address the criminogenic and non-criminogenic **needs** of an offender. These are subdivided into dynamic and static risk factors. Dynamic risk factors are needs that, when altered, can be associated with changes in criminal behaviour such as interpersonal relationships (Bonta and Andrews, 2017). Static risk factors are those that do not change and can be considered immutable (such as gender or ethnicity). The final principle is **responsivity** including ‘general’ responsivity that posits cognitive-behavioural interventions are more efficacious than nonbehavioral approaches (Andrews et al., 1990). ‘Specific’ responsivity includes a range of tailored interventions deployed to treat or manage alcohol consumption.

Meta-analyses of OBPs have supported the notion that these interventions either in custody or among community-based offender populations can reduce reoffending (Bahr et al., 2012; Andrews et al., 1990). Lipsey’s meta-analyses found treatment for juvenile offenders resulted in a 10% reduction in reoffending. When methodological differences (such as sample size) and treatment components (fidelity and dosage) were accounted for, the reduction in reoffending was 30% compared to 6% for other forms of treatment. These studies suggested that there was a ‘dosage’ effect with more intensive interventions (e.g. longer and more often) more likely to be effective regardless of criminal offence type (Lipsey, 1995; 1992). The intensity of the intervention was seen to be key, with 26 weeks, two or more hours of contact

per week and 100 hours of contact¹⁴ becoming the expected levels of treatment (Lipsey, 1995). Underpinning the concept of RNR is ‘integrity’ whereby organisations must quality assure fidelity to evidence-based practices (Goggin and Gendreau, 2006; Lowenkamp et al., 2006; Landenburger and Lipsey, 2005). Moreover, it is the failure of implementation that causes discordance with the evidence-based theory resulting in an ‘implementation gap’ (Andrews and Dowden, 2005).

The literature has focused on cognitive behavioural therapy (CBT) as the designated treatment modality to affect behavioural changes that will facilitate reductions in general reoffending (Landenburger and Lipsey, 2005; Wilson et al., 2005; Pearson et al., 2002) whilst there is cognisance that substance misuse may require specialist, tailored components (Lipsey et al., 2007). CBT for people in prison aims to affect change by addressing criminal and substance-musing thinking patterns by providing coping strategies to manage high-risk situations. Despite its attraction, other reviews have been more equivocal about its role in reducing recidivism (de Andrade et al., 2018; Perry et al., 2016; Lipton et al., 2002) and commentators have argued that prison-based CBT interventions can be vague, generic and lack tailoring to the target population (Taxman and Cundy, 2015). Use of contingency management techniques has been shown to have some validity in substance misuse community settings although its efficacy within a custodial setting remains uncertain (Gendreau and Listwan, 2018; Marlowe, 2011). Use of pharmacological interventions, whilst used extensively within a UK context, remains under-utilised elsewhere (e.g. North America) as potentially “*substituting one addiction for another*” (Marlow, 2011: 37S).

¹⁴ 50 hours can justify NOMS accreditation.

In England, fidelity to delivering manualised treatment was assured through an inspection and auditing regime approved (accredited) by an independent panel - the Correctional Services Accreditation and Advisory Panel (Maguire et al., 2010). According to the MOJ, there were 47 accredited programmes of which thirteen were specifically geared to drugs and/or alcohol during 2013-2014 (Ministry of Justice, 2017, personal communication). The use of accredited programmes has been critiqued, with commentators arguing that they have been seen purely as an end in themselves rather than as providing vital wrap-around services or motivational or emotional support (Maquire and Raynor, 2006; 2017).

The utilisation of RNR concepts within substance misuse treatment has been shown to be problematic where differing treatments are rarely examined for their specific role in reducing reoffending. Moreover, some commentators argue that many of the programmes evaluated do not reflect routine practice and benefit from abnormal levels of funding and support (Lab and Whitehead, 1990) that in turn lead to higher rates of “*therapeutic integrity*” whereby skilled therapists demonstrate close adherence to evidence-based treatment approaches (Smith et al., 2009: 161) . Operationalising severity of substance misuse to encompass dependence and how consumption changes over time has been shown to be problematic (Taxman et al., 2006). Marlowe (2011) argues that introduction of non-dependent and low-risk substance misusers may dilute a treatment effect on recidivism. The delivery of treatment within custodial settings has been seen as problematic as few people in prison may access the treatment they need, non-evidence based interventions such as group-based drug education are used (Pearson and Lipton, 1999), and what interventions are available are delivered poorly (Marlowe, 2011; Taxman et al., 2007).

There is also a suggestion that substance misuse practitioners are resistant to treating high-risk people in prison as they are more likely to be disruptive and lack motivation to change (Thanner and Taxman, 2003). Moreover, critics also argue that prison-based treatment will include people in prison with tangential needs (e.g. involvement in activities relating to the production or supply of substances), and that clinical screening tools (such as AUDIT) may overstate the need for treatment by focusing on a person in prison's immediate severity of use. Furthermore, treatment selection may be affected by the extent of self-referrals or court-mandated treatment (Jolley and Kerbs, 2010). For these authors, psychosocial interventions in prisons tend to be characterised by an “*overreliance on low-intensity and non-clinical interventions*” (ibid: 291).

Despite these concerns, there is some suggestion that RNR compliance does have a positive effect on recidivism for high-risk offenders in substance misuse treatment (Thanner and Taxman, 2003) although a meta-analysis of RNR compliance in substance misuse programmes suggested that reductions in offending and managing ongoing substance use (e.g. avoiding relapse) are not mutually reinforcing (Prendergast et al., 2013). Whilst adherence to RNR elements can demonstrate significant changes to offending rates post-treatment, the effect on reducing drug or alcohol consumption alone may not directly impact on criminal behaviour.

2.4 Concluding Thoughts

An overarching hypothesis is one of strategic and policy continuity. Despite the hyperbole for ‘revolutions’ and ‘transformation’ there has been a notable adherence to previous governments’ grand designs for prison-based treatment. Whilst effective continuity-of-care remains the holy grail, the evidence in this chapter suggests that this remains elusive. It is also contended that there are competing and contradictory commentaries of government policies. The criminal justice hypothesis on the one hand suggests a view that government policies are too harsh penalising marginal groups, which can be contrasted, on the other hand, to alternative arguments advocating prison policy as too weak to enforce a pure vision of abstinence-based recovery. This thesis contends that these viewpoints have proffered a too politicised and Manichean worldview to helpfully describe governmental policies for people in prison during the time of this study.

Rather it is contended that if one looks at the development of services through purely a prison lens, there has been a ‘public health turn’ whereby treatment has moved towards delivering health-based interventions, placing an individual’s alcohol use often within a wider lifestyle context. This should be placed in the context of the ‘just deserts’ approach offered in the 1990s. This has not been due to a tacit change in government priorities, but a function of the shift towards NHS bodies who now oversee funding arrangements. This is an important shift, as previous assumptions that underpin the ‘what works’ agenda such as RNR, may no longer apply as treatment is reconfigured towards health-related needs. Clinical risk (e.g. overdose, medicines management) may have greater salience in this new health model than in previous crime reduction initiatives. Few of these interventions in this new context have been formally evaluated.

Alcohol remains the ‘un-drug’ (Farabee et al., 2002). Prison-based treatment services fall too easily within the substance misuse catch-all. Although a clinical treatment infrastructure has been effectively created as shown, it remains unclear what the wider psychosocial offer is. It is likely that non-clinical provision for people in prison with an AUD may be subject to variations in service delivery dependent on local commissioning priorities and the treatment services running them (Fitzpatrick and Thorne, 2011; Duke, 2005). The ‘public health turn’ hypothesis advocated above, is likely also to come to the fore as clinical pathways are easier to operationalise as patient safety can be viewed as a key mobiliser. I contend that commissioning changes may only be one part of the puzzle, rather a default to a form of clinical pragmatism is more a function of a wider failure to instil a clear vision of recovery and desistance within services working within a prison-setting (compounded by the constraints of overcrowding and cuts to service provision). Concepts of desistance and recovery will be further explored in Chapter Five.

Chapter 3: Extent and Nature of Alcohol Use Disorders amongst People in Prison

3.1 Introduction

The role that alcohol plays in criminal behaviour will be explored in this chapter including an examination of prevalence rates for AUDs across the full criminal justice system, including prisons. A final section will explore the social correlates of alcohol consumption and criminal behaviour.

3.2 Alcohol and Offending

The extent to which excessive alcohol consumption is a contributory factor in a range of health and social problems is well documented with studies showing its significant negative impact on national economies (Griswold et al, 2019; Rehm and Imtiaz, 2016; Rehm et al., 2009; Baumberg, 2006). Research has linked excessive and episodic consumption of alcohol with offending levels (Richardson and Budd, 2003) including other anti-social behaviour from criminal damage to intimate partner violence (Beynon et al., 2019; Karriker-Jaffe et al., 2017; Kachadourian et al., 2012; Leonard, 2005). A systematic review and meta-analysis demonstrated associations between increased alcohol consumption and higher rates of road traffic accidents and physical injuries (Taylor et al., 2010).

A key component of the relationship between alcohol and crime is the extent to which excessive alcohol consumption triggers impulsive or deliberate acts of violence (Maldonado et al., 2011; Lundholm et al., 2013; Haggard-Grann et al., 2006; Fergusson et al., 1996).

Lipsey et al.'s (1997) meta-analysis was able to demonstrate statistically significant correlations between chronic alcohol abuse and violence. Links have also been shown with murder, to the extent that over one-third (37%) of murderers were intoxicated at the time of the offence (Kuhns et al., 2014). Seigny and Coontz (2008) created typologies of male and female alcohol misusers amongst Pennsylvania's arrestee population and found violent offending a consistent theme across both genders detained in police custody. Male segments included "nuisance inebriates" and "alcohol-dependent hustlers" (p443) and female groupings comprised "alcoholic down and outs" (p447 - e.g. socially disadvantaged) and "alcohol dependent sex workers" (p448). In addition to violent crime, an association with property crimes has also been demonstrated (Carpenter, 2007). In a study of 16,698 inmates in the US, alcohol intoxication was shown to be strongly linked to not just homicide, physical and sexual assault even when the offenders drank in moderation, but also to robbery and burglary (Felson and Staff., 2010).

Acquisitive crime and violent offending have been shown to be correlated to reoffending among alcohol misusers known to English community treatment services (Willey et al., 2016). US offenders incarcerated for violent and property crimes have been shown to exhibit similar higher levels of drinking immediately before offending (Welte and Miller, 1987) with offenders more likely to be caught and arrested under the influence of alcohol (Roizen, 1997).

Despite this association between alcohol consumption, violence and other forms of criminal behaviours, there remain doubts over the mechanisms that underpin causality (Lipsey, 1997). Experimental research illustrates a dosage effect whereby increased alcohol consumption is a precursor for aggression and other violent activities for both men and women (Exum, 2006; Duke et al., 2011). Bushman (2002) describes three theoretical models: The '*expectancy-*

model' suggests that learned beliefs about alcohol consumption explain changes in behaviour rather than the pharmacological effects of ethanol itself. The '*physiological disinhibition*' model (also known as the 'pharmacological disinhibition' model) has been the 'traditional' (although largely out-of-favour) explanation for alcohol-related crime (Exum, 2006), whereby alcohol stimulates humans' inherent violent nature by suppressing cortical brain functions that keep this innate aggression in check. The third model (the '*in-direct causal*' model) argues that "*alcohol increases aggression by causing certain cognitive, emotional and physiological changes that increase the probability of aggression*" (Bushman, 2002; 234). Physiological effects due to the consumption of alcohol also interact with external, situational factors such as a lack of self-control or third-party provocation that make violence more likely (Assaad and Exum, 2002). For example, Gibson et al. (2004) examined drinking patterns among 268 US college students and found that low self-control had significant effects on the level of binge drinking and related harmful behaviours. Piquero et al. (2002) argued in favour of absence of self-control combined with situational factors as predictors of violent behaviour. Felson et al.'s (2008) study of 5,142 Finnish students suggested that the effects of intoxication can be linked to violence, vandalism and other impulsive or opportunistic crimes, but the relation with other crimes are 'spurious' in that there is no association (directly or indirectly) between drinking and offending. Positing a "*worst of both worlds*" hypothesis (Walters, 2014), results from a study of 1,435 inmates released from a US federal prison, show that substance misuse and crime interacted with each other through convergent lifestyles, so that the presence of one component is heightened by the presence of the other. Caution is advised with drawing conclusions from this study as 90% of the sample were illicit drug users rather than people in prison with an AUD. Exum (2006) concluded that five "real-world" factors increase the probability of aggression or violence: (1) males drinking; (2) vodka or distilled spirits are imbibed; (3) a 'high' dosage is consumed; (4)

victim retaliation is possible and (5) non-aggression responses are not available. Therefore, alcohol consumption and offending may be causally but indirectly linked with other external, situational factors that act as a catalyst for both behaviours.

Despite this research, the relationship between alcohol and offending remains clouded regarding the direction or temporal nature of the relationship. Experimental and one-off cross-sectional studies are limited by the scope of the associations they are trying to measure, including the fact that many studies test samples of US college campus students, which are not representative of the offender population. Moreover, studies have tended to focus on 'dry' drinking cultures which are characterised by drinking to the point of intoxication in one single binge event as opposed to drinking smaller amounts over longer periods of time (Felson et al., 2008). Studies have however, been able to test the relationship between alcohol and offending using longitudinal studies that examine the associations at different points in time. Newcomb and McGee's (1989) US study found that alcohol use when young did predict later antisocial behaviours, whilst youthful antisocial behaviour when young was not associated with alcohol use later in life. A New Zealand birth cohort followed-up to 21 years of age found increasing alcohol use was associated with significantly increased odds of violent and property crime (Fergusson and Horwood, 2000). More recent longitudinal studies have begun to imply a more direct and causal relationship between alcohol and offending (Popovici et al., 2012). For instance, in a longitudinal study of individuals aged up to 30 years in New Zealand, people with five or more AUD symptoms were shown to commit violent acts at a rate of between 4-12 times that of those with no AUD markers (Boden et al., 2012). In this study, symptoms of problematic alcohol use were seen to be causally associated with impulsive criminal behaviours such as assault, vandalism, property damage and arson at different life points (Boden et al., 2013). Carpenter (2007) also found heavy drinking was

associated with property or ‘nuisance’ crimes among US adolescents. Although many of these studies are limited by the age and type of participants recruited, a UK longitudinal study of 411 males from London as part of the Cambridge Study in Delinquent Development followed-up individuals from 18 to 48 years. This study found binge drinkers in adolescence and adulthood were more likely to be both violent and non-violent offenders into middle age (Jennings et al., 2015). The study also points towards “*adult adjustment*” factors that exacerbate alcohol consumption and for males, “...*some sort of situational event that led them towards serious alcohol use*” (Jennings et al., 2015: 460).

Therefore, the interaction between the physiological effects of alcohol and external or situational factors are only some of the explanations between alcohol use and crime. The ‘situational event’ mentioned by Jennings et al. (2015) may encompass other theoretical mechanisms. These include drinking heavily in response to personal stressful circumstances such as unemployment or bereavement (Mullahy and Sindelar, 1996), such that stressful life events may predict problematic behaviours one-year later (Farrington et al., 2006). Overall, this has implications for the potential treatment of offenders with AUDs in that alcohol consumption may be just one potential trigger for an individual to commit anti-social or violent acts and that a person’s psychology will have a huge bearing to their propensity to commit a crime. The next section attempts to understand the extent and nature of people in prison with an AUDs who present to treatment services in custodial settings.

3.2 Prevalence of Alcohol Use Disorders among People in Prison and the Criminal Justice System

This section presents an overview of the prevalence rates of AUDs within an international prison context. A search was undertaken of electronic databases using the Middlesex University on-line library; BioMed Central; PubMed, MEDLINE and Google Scholar. The inclusion criteria for references included search terms for AUD prevalence estimates that created combinations of ‘prevalence’ with ‘reconviction’, ‘reoffending’, ‘recidivism’, ‘prison’, ‘criminal justice’, criminal justice system/CJS’, ‘alcohol’, ‘drinking’ and ‘substance use/misuse’. The inclusion criteria included any international study (North America, Europe and Australia/New Zealand) since 2000 (although consideration of any paper that included important findings prior to that period was considered), that included a statistical measure of prevalence across national or local (e.g. regional, federal or local) settings. Academic, peer reviewed papers and government reports (‘grey literature’) were included (p45). Criminal justice settings including prison, offenders on community sentences and at the point of police custody were included to allow for an understanding of whether differences are noted by setting. Non-English language papers and any non-statistical pieces (e.g. editorials) were excluded from the analysis. Compared to the general population, the prevalence of AUD has been shown to be consistently higher for offenders in police custody (e.g. Rekrut-Lupa and Lapa, 2014) and in probation (Coulton et al., 2012). A national prevalence study of detainees in police custody in England and Wales found that over half (57%) were clinically dependent on alcohol (Boreham et al., 2007) resulting in AUDs being the main issue for custody staff, and among these detainees, their need for treatment was much higher than any other type of presenting issue (Man, 2002). Detainees assessed in US police custody sites as part of the Arrestee Drug Abuse Monitoring programme between 2007-10 found that drinkers were less

likely to have received treatment compared to illicit drug users (apart from cannabis users), although AUD severity did predict historical treatment engagement amongst this cohort (Hunt et al., 2015).

Studies have highlighted the preponderance of substance misuse needs among the prison population such that a study of nearly 50,000 people in prison in Sweden found an overwhelming majority (88%) of violent offending was associated with alcohol and drugs (Fazel et al., 2016). Studies have shown a wide range of estimates for AUDs among the prison population. Fazel et al. (2017) suggest methodological variations account for the heterogeneity in the prevalence estimates such as who undertook the survey (clinically trained staff tend to record lower rates for an AUD in comparison to other researchers), and the variety of screening tools used. The differing methodologies also illustrate a range of AUD measurements ('dependence'; 'heavy drinkers'; 'binge drinking'; 'number of days drinking' etc.), differing screening tools and the diversity of prison establishments holding differing type of offenders (remand, sentenced or receiving community sentences), alongside gender differences. The prevalence ranges in national studies (Table 1) and local (Table 2) studies are shown below:

Table 1: Summary of Prevalence Estimates: National Studies

Author	Country	Study Type	Sample	Prisoner Category	Tool(s) Used	Prevalence Estimates
Singleton et al. (1998)	England and Wales	Cross-sectional survey	3,142	Remand and sentenced	AUDIT	30% prevalence for “severe alcohol problems” (AUDIT >-16)
Fazel et al. (2006)	England, Ireland, New Zealand and US	Meta-analysis (7 studies)	4,141	Multiple	Multiple	17-30% male and 10-24% female for “alcohol abuse/dependence”
Lukasiewicz et al., 2007	France	Cross-sectional survey	998 randomly selected people in prison in 23 French prisons	Multiple	DSM-IV psychiatric diagnostic criteria	18.4% for alcohol abuse and dependence in the last 12 months
Stewart (2008)	England and Wales	Cross-sectional survey	1,457	“Newly sentenced”	Generic Alcohol questions	36% were “heavy drinkers” (defined as consuming more than twice the recommended daily drinking limits in the month before prison);
Lintonen et al. (2011)	Finland	Cross-sectional survey	610 Finnish people in prison (entire prison population)	Multiple	Standardized Psychiatric Interview, DSM-IV and ICD-10	68% men, 70% female (DSM-IV); 72% men, 70% female (ICD-10) with ‘substance abuse’; 52% men, 51% female ‘dependent’ (DSM-IV); 62% men, 52% female (ICD-10) ‘dependent’
Light et al. (2013)	England and Wales	The Surveying Prisoner Crime Reduction (SPCR)	1,435	Sentenced between one month and four years during 2005 and between 18	Generic Alcohol questions	22% drank alcohol every day in the four weeks before custody

		longitudinal cohort study		months and four years in 2007		
Williams et al. (2015)	England and Wales	The Surveying Prisoner Crime Reduction (SPCR) longitudinal cohort study	1,435	Young adults (18-20) and older people in prison (>21) sentenced between one month and four years during 2005 and between 18 months and four years in 2007	Generic Alcohol questions	Of those who drank in the four weeks before custody the median was 12 days across one month with a median consumption of 14 units during this period. 49% were also classified as “binge drinkers” compared to 41% of offenders aged 21 years or more.
Chang et al. (2015)	Sweden	Population Registers/Data Linkage	47,326	Multiple	ICD 8-10	21% male; 28% female “alcohol use disorder”
Fazel et al. (2017)	Australia, Austria, England, France, Germany, Iceland, Ireland, Netherlands, New Zealand and US	Updated meta-analysis of Fazel et al., 2006 (15 studies)	12,739	Multiple	Multiple	24% with an “alcohol use disorder”; 16-51% male; 10-30% female
Travers and Mann (2018)	England and Wales	Cross-sectional analysis of Offender Assessments	95,346 male offenders and 14,787 females	Multiple - offenders sentenced to a community order or suspended sentence, or were released from prison between 2008 and 2009	Offender Assessment questions: “Recent binge drinking” and “Problematic drinking”	45% male and 41% females reporting “recent binge drinking”; 41% male and 37% female reporting “problematic drinking”

Table 2: Summary of Prevalence Estimates: Localised (sub-national) Studies

Author	Country	Study Type	Sample	Prisoner Category	Tool(s) Used	Prevalence Estimates
Mason et al., 1997	(Durham) England	Cross-sectional survey	548	Male remand	DSM-IV screening	32% dependent.
Brooke et al., 1998	England and Wales	Cross-sectional survey	995	13 male, 3 female prisons, 3 Young Offenders Institution; Remand	CAGE, Severity of Dependence Scales	12.1% of men and 6.5% of female people in prison (adult and young offenders) were dependent on alcohol
Jones and Hoffman (2006)	England and US	Cross-sectional survey	155 in two English prisons; 6,881 in Minnesota	Multiple	Comprehensive Addiction and Psychological Evaluation (CAPE)	45% dependence level in one UK prison (n=118 at HMP Grendon) compared to 29% from 6,881 people in prison in Minnesota
Newbury-Birch et al., 2009	(North East) England	Cross-sectional survey	673	Community sentence	AUDIT	35% alcohol-dependent with 66% reported as having an AUD (scoring on AUDIT at 8+);
MacAskill et al., 2011; Parkes et al., 2010	Scotland	Cross-sectional survey	259 in 1 prison	Remand and sentenced (male)	AUDIT	36% alcohol-dependent; 73% categorised as having an AUD; higher AUDIT scores noticed among short-term prisoners;
Kissel et al., 2013; 2014	Wales and South West England	Prospective longitudinal interview	241 and 170 followed up 3 weeks later	Pre-trial men newly imprisoned males	AUDIT	48% dependent drinkers; 81% drinking at hazardous levels

Newbury-Birch et al., 2014	London, North East and South East England	Multicentre factorial cluster randomized controlled trial.	525 participants randomised to information-only; brief advice; brief lifestyle counselling	Community Sentences	AUDIT	43% harmful of problematic drinking
Kopak et al. (2014)	US (Minnesota)	Cross-sectional survey	6871 male and 801 female	Department of Corrections	DSM-IV and DSM-V	32% alcohol 'abuse' using DSM-IV; 10% 'moderate' AUD, 32% 'severe' or 'dependent' using DSM-V
Georgiades et al., 2016	(South West) England	Cross-sectional survey	100	In prison or community sentence	Michigan Alcohol Screening Test	36% drink problematically
Bebbington et al., 2017	(London) England	Cross-sectional survey	197 male and 171 female people in prison across two London prisons	Remand and sentenced (male and female)	AUDIT and Severity of Alcohol Dependence questionnaire	33% were reported as dependent on alcohol
Addison et al. (2018)	South West and North East England	Randomised control trial of screening (control); brief advice and brief advice plus counselling	2228 arrestees screened; 205 arrestees across six police custody sites enrolled onto study	Police custody	AUDIT	34% hazardous; 16% harmful and 50% dependent drinkers

Proctor et al. (2019)	US County Jail (unspecified)	Cross-sectional survey in 2008 and 2016	176 male inmates in 2008 and 200 in 2016	County Jail	Comprehensive Addictions and Psychological Evaluation	81.3% DSM-IV dependent in 2008; 49.7% with moderate-severe AUD in 2016
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Maggia et al. (2004) suggest that scores derived from the use of screening tools will depend on the point at which people in prison enter the prison system – more reliable scores may be captured once the person in prison has settled into prison life. Despite the upper end of estimates suggesting that up to half of people in prison may be dependent (the most severe form of AUD), only less than one-fifth (15-19%) of people in prison surveyed in one national English prison survey have stated that they needed help for their drinking, and only 7% stated they have received help post release (Hopkins et al., 2014; Light et al., 2013). One study in South Wales compared prisoners' drinking levels with a direct question on perceived need for alcohol treatment; the findings suggested that alcohol issues were not recognised by people in prison themselves, with most receiving help only if they had a concurrent drug problem (Kissel et al., 2013; 2014). Mason et al. (1997) also found inconsistencies in the prison screening tools that consistently under-reported AUDs including people in prison that required clinical support but who did not receive treatment. In addition, discrepancies in treatment uptake have also been demonstrated by gender, with female people in prison less likely to receive treatment for an AUD (Light et al., 2013).

The need for accessing services whilst in prison was also identified in a study of people in prison in prison found that longer sentences, younger in age and being motivated to access services were all associated with accessing prison-based treatment for an AUD (Obstbaum et al., 2015). Levels of unmet need are further highlighted in a study of offenders on a community sentence, with 41% defined as having an AUD but who were determined as not requiring an intervention. A further 14% of offenders were recorded as dependent who also did not receive any support for their drinking (Newbury-Birch et al., 2009). One study of 115 people in prison across the Northeast of the US found high prevalence rates of alcohol treatment need (61%) including 29% reporting possible dependence using the Michigan

Alcohol Screening Test (White et al., 2001). High rates of domestic violence were also reported among this cohort. There was no information linking this need to treatment uptake; however, the study found people in prison with an alcohol need had higher rates of antisocial personality and anxiety problems compared to people in prison without an alcohol problem. The authors suggest that these traits may result in people in prison being more disruptive and more likely to disengage from treatment, should it be offered. We may therefore hypothesize that people in prison who access treatment may differ from other people in prison with an AUD who do not engage with services.

3.3 Factors Associated with Alcohol Use Disorders among People in Prison

Studies have consistently shown a link between offending and AUDs among young offenders. Analysis of people in prison across England and Wales showed that younger offenders (18-20) are more likely to link offending to their alcohol consumption compared to older prisoners, whilst stating that not drinking too much is essential in preventing recidivism (Williams et al., 2015). Other studies also highlight an association between drinking, age and reoffending (McSweeney, 2015).

Gender differences between people in prison have been noted with male people in prison drinking more often compared to females, although often at the same frequency of a median 12 days per calendar month (Light et al., 2013). Female people in prison who report an AUD are also more likely to exhibit comorbid mental health needs (Zlotnick et al., 2008; Scott et al., 2015). The importance of excessive binge drinking has also been determined as predicting female offenders' future offending (Travers and Mann, 2018). Ethnicity may also be a factor; people in prison defined as 'white' were more likely to be imprisoned due to alcohol-related

issues (Williams et al., 2015; Hopkins et al., 2014). In addition, housing support for drug and alcohol users has also been highlighted as a key need (Williams et al., 2012).

Other covariates include ‘social stressors’ (Calcaterra et al., 2014) such as family pressures including a family member with a previous or current alcohol problem; being abused as a child and seeing violence at home as a child. People in prison with a family member with an alcohol problem were shown to need help at two and half times (31% compared to 12%) the rate of other people in prison (Williams et al., 2015). In one US study of 1198 female prisoners, childhood neglect was the main predictor of alcohol dependence (Mullings, 2004). Furthermore, strong links have been made between alcohol misuse to varying degrees and comorbid mental health problems (Georgiades et al., 2016; Mir et al., 2015; McMurrin et al., 2011), use of illicit drugs (Bonta et al., 1998), and a wide range of socio-economic problems (McKeganey et al., 2016). One quantitative study in police custody across London showed that for all arrestees requiring a medical intervention, AUDs, illicit drug use and mental health problems were all inextricably intertwined (Sondhi and Williams, 2017).

3.4 Concluding Thoughts

Prevalence estimates (Fazel et al., 2017) point towards around one-quarter of all people in prison being subject to an AUD (rising to between a third and half among more localised estimates). It is also suggested that offenders with differential characteristics and attributes may lead to variances in treatment outcomes. Later chapters will emphasize the need to ensure equivalence between the treated and untreated groups and describe how this will be achieved to ensure robust treatment effect estimates.

Chapter 4: Review of the Evidence from Reconviction Studies: A Literature Review

4.1 Introduction

Although studies consistently highlight the importance of alcohol as a dynamic factor linked to offending (Andrews and Bonta, 2010), there is a relatively limited evidence base regarding the efficacy of alcohol-specific interventions. A literature search was undertaken using electronic databases including the Middlesex University on-line library; BioMed Central; PubMed, MEDLINE and Google Scholar as described in Chapter Three. Reconviction rates were compared across different criminal justice settings including prison, community sentences (e.g. probation) and in police custody. These different settings were included to determine whether there was any specific treatment effect by population. That is, did any intervention in a particular setting show promise and what reasons underpinned this effect. The literature discusses three types of reconviction study for offenders on either a custodial or community sentence. Firstly, reconviction rates for offenders involved in non-substance misuse specific offending programmes of which alcohol consumption may form part of the analytical framework; second, studies of substance misuse interventions of which alcohol is explicitly or implicitly included alongside illicit drug misuse; and finally, alcohol-specific interventions.

4.2 ‘General’ reconviction studies that include alcohol as a factor

A Canadian meta-analysis (Andrews et al., 1990) of five datasets offered a tiered approach to understanding reoffending by examining key attributes associated with the likelihood of a

person reoffending. A primary group (described as the “big four”) was identified comprising: offenders with a history of criminal behaviour; antisocial personalities; antisocial attitudes, values, beliefs and cognitive emotional states; and antisocial peers. The secondary group (‘modest four’) included low levels of rewards in the home (family/marital), school/work, and leisure/recreation; and a wider definition of ‘substance abuse’ that incorporates, but did not distinguish between, drug and/or alcohol misuse. Andrews et al.’s (2012: 127) updated meta-analysis has now suggested a significant link between female substance misuse and reoffending placing it within a ‘Big Five’ grouping.

Other meta-analyses also found strong correlations between ‘substance abuse’ and reoffending. Olver et al. (2014) meta-analysis found a correlation (r) of 0.25 (0.18 outside North America) whilst Downden and Brown (2002) reported an effect size of 0.22, compared to more moderate effect sizes noted ($r=0.10$) by Gendreau et al. (1996). Where ‘alcohol abuse’ has been recorded, these effects remain low from 0.12 (Downden and Brown, 2002) to 0.06 (Bonta et al., 1998).

However as shown, there is heterogeneity in the measures used to determine alcohol consumption across studies and variability in use of validated screening tools (e.g. AUDIT) to differentiate need. A one-year follow-up of people in prison as part of the Ministry of Justice’s Resettlement Survey did find a statistical correlation between ‘alcohol problems before custody’, ‘drinking frequency’ and reconviction (Light et al., 2013), but any statistical significance was lost after adjustment for other characteristics such as drug misuse (Brunton-Smith and Hopkins, 2013; May et al., 2008).

One study in Sweden among 4,152 people in prison with a known substance misuse history (as measured by the Addiction Severity Index) found recidivism was not predicted by alcohol use, rather ‘binge drinking’ was negatively associated with reconviction, suggesting the primacy of other prognostics (Hakansson and Berglund, 2012). A study of 4,381 people in prison, surveyed across Pennsylvania Department of Corrections, found that substance misuse disorders were significantly correlated with reductions in ‘general’ (comprising new and technical violations) reoffending, which was shown to be mirrored in a sample of people in prison reporting dual diagnosis issues (Houser et al., 2019). In an older study of 250 Scottish people in prison released back into the community across two prisons, people in prison who had not been assessed as having ‘addiction problems’ were more likely to reoffend (Hancock and Raeside, 2009). The authors speculated that treatment may have been effective in preventing future criminal activities, although there was no supporting evidence for this. Employability, and the level of social deprivation in the home location of people in prison, were shown to be key factors in predicting recidivism in a final regression model for this study (Hancock and Raeside, 2009). In comparison, a US randomised controlled trial of 251 offenders receiving three community-based interventions (alcohol specific programs such as attendance at Alcoholics Anonymous were incorporated within the three interventions) found that changes in alcohol use (number of days drinking) was associated with reductions in reoffending with major changes noted between the six and twelve-month period (Wooditch et al., 2014).

A UK study of 494 violent offenders found that alcohol dependence (as measured on AUDIT) was a key factor associated with recidivism up to five years from release (Freestone et al., 2017). This study found high levels of alcohol dependence (42% of the sample) with over half (52%) reporting that they were intoxicated from alcohol at the time of the offence.

The lack of peer influence and evidence of no prior planning were also associative of future offending, leading the authors to conclude that violent triggers may be “*highly situational and complex*” (p1406).

Table 3: Reconviction rates for ‘generic’ studies that include alcohol as a predictive measure

Author	Country	Study Type	Sample	Prisoner Category	Re-offending Measure	AUD linked to reoffending	Reoffending for People in prison with an AUD
Bonta et al. (1998)	International	Meta-analysis	925 (p131)	‘Offenders’	‘General recidivism; (p125)	Yes	R=0.06 for ‘alcohol’
Palmer and Hollin, 2007	UK (England)	Longitudinal	150 female people in prison aged 16-57 years	Female prisoners	2.5-year reconviction	Yes	Statistically significant differences between “alcohol/drug” users as measured by Level of Service Inventory – Revised. Alcohol/drug users more likely to reoffend.
May et al. (2008)	UK	Resettlement Survey	4,898 prisoners	3 sweeps 2001, 2003 and 2004 across representative sample of prisons in England	Reconviction within 1-year	No	Initial bivariate correlations cancelled out by multivariate logistic models. “Alcohol problems before custody”; “drinking frequency” and attendance at “drug programmes” not associated with reoffending

Hancock and Raeside (2009)	UK (Scotland)	Cross-Sectional	Around 250 prisoners	Two prisons – one “high security” and one “low security)	Reconviction with 2 years	No	“alcohol dependency” and “alcohol addiction” not associated with reconviction. Not being assessed by “addiction services” was correlated with reoffending
Andrews et al. (2012)	Canada	Meta-Analysis (five studies from 1984-2007)	2069 male and 354 female offenders	“Offenders” including community supervision	“Recidivism” including “any new” offending; reconviction and “post program” reoffending	Yes	$r=0.47$ (female), $r=0.17$ (male) with ‘substance abuse’; Area Under the Curve=.771 (female), .611 (male). ‘Substance abuse’ is correlates with recidivism especially for females
Hakansson and Berglund, 2012	Sweden	Longitudinal	4,152 with 2,862 returning to the criminal justice system	Prison and probation	Recidivism defined as returning to the criminal justice system	No	“Binge drinking” negatively associated with reoffending
Light et al. (2013)	UK	Surveying Prisoner Crime Reduction survey longitudinal cohort study	1,435 (1,303 males, 132 females)	Sentenced between one month and four years during 2005 and between 18 months and four years in 2007	Reconviction within 1-year	Yes	‘Drinking alcohol every day in the 4 weeks before custody’ and ‘binge drinking’ (but only for female prisoners) correlated with reconviction

Olver et al. (2014)	International	Meta-analysis of 128 studies	137,931 offenders using the Level of Service Scale	'offenders'	Recidivism coded as 'yes' or 'no'	Yes – but within substance misuse definition	High correlation ($r=0.20$) between 'substance abuse' and recidivism
Wooditch et al. (2014)	US – 3 probation offices in Maryland	Longitudinal	251 (74.5% male, 25.5% female)	Probation	Self-reported criminal activity at four points with a 12-month period	Yes	Reductions in alcohol use (along with reduced associations with criminally involved family members) associated with reduced criminal behaviour
Freestone et al. (2017)	UK	Cohort	494 violent offenders	People in prison serving two or more years for a sexual or violent offence	Police National Computer measure of reoffending	Yes	Alcohol dependence (measured by AUDIT) predictive of reoffending up to 5 years post release

4.3 Reconviction Studies for drug and alcohol or ‘substance misuse’ interventions

As with the generic reconviction studies, there is variability in the outcomes of studies that integrate drug and alcohol or substance misuse interventions. People in prison interviewed across a national survey in England and Wales as receiving a drug or alcohol intervention (bundled together were detoxification, accredited drug and alcohol programmes, and ‘other’ drug and alcohol interventions), were all shown to reoffend at similar rates when compared to people in prison not receiving a drug and alcohol intervention (Brunton-Smith and Hopkins, 2013). There is a suggestion that the risk of reconviction may be higher for people in prison with a history of drug misuse than for people in prison drinking alcohol problematically, which also holds if a person in prison takes drugs and drinks in combination (Hakansson and Berglund, 2012; Shroeder et al., 2007; Bonta et al., 1998).

When considering drug and alcohol treatment effects, the studies presented above show considerable heterogeneity across multiple treatment modalities including several that focused on the impact of Therapeutic Communities (TCs) which offer more intensive, residential-style support. Prison-based TCs focus on treating substance misuse needs that emphasises social learning and peer influence. Participants are required to demonstrate ‘responsible concern’ for their peers by supporting the recovery of fellow people in prison (De Leon, 2000). The model requires people in prison to become committed to the TC community by assuming role model and leadership positions. The ‘community as method’ approach encourages intensive relationships between peers that encourage openness and recognition or awareness of vulnerability to substance misuse among participants.

The evidence base for prison-based TCs have suggested a treatment effect in reducing relapse and/or reoffending although some studies are more sceptical (Welsh et al., 2014), suggesting that recidivism effects are dependent on the recidivism measure chosen (Jensen and Kane, 2012; Welsh and Zajac, 2013), or that any treatment effect disappears in the longer-term (Zhang et al., 2011). A positive treatment effect is based on the intensity of the offer, supported by programme fidelity and development of post-release pathways (Bahr et al., 2012; Olson et al., 2009). A Cochrane Review (Mitchell et al., 2012) found that within prison settings, TCs provided “*consistent but modest*” (p6) effects on recidivism compared to other forms of treatment options such as counselling or pharmacological support. The outcomes for different intervention types were mixed and no conclusions could be drawn from the data. Two similar systematic reviews (Doyle et al., 2019; De Andrade et al., 2018) also found TCs to be a promising mechanism to affect change in reoffending but both analyses were largely focused on illicit drug use with alcohol enveloped within a wider substance misuse definition. The authors also highlight the absence of methodologically strong research designs to measure robustly a treatment effect and particularly, fundamental concerns with drawing any conclusions as to a treatment effect. Many people in prison report a range of substance misuse needs and many studies to not differentiate between illicit drug use and alcohol consumption.

In England, there are five ‘Democratic Therapeutic Communities’ (provided at HMPs Dovegate, Gartree, Grendon, Send and Warren Hill) where access is based on criteria that prioritise stable people in prison who are drug-free (including not using opiate-based therapies), with no diagnosed mental illnesses (including self-harm). These selection effects also have been shown to influence evaluations of TCs where inclusion criteria result in samples based on volunteers who were sufficiently motivated to start treatment or engage in

post-release support (Zhang et al., 2011; Olson et al., 2009). Welsh and McGrain (2008) argue that 'treatment readiness' is a factor associated with engagement. Kelly and Welsh (2016) examined treatment 'climate' measures and found statistically significant differences across different treatment units within the same establishment. Davidson and Young (2019) argue that TC participants experience little change in engagement. Rather, engagement with the programme changed how they framed the treatment experience in terms of deriving a meaning from their engagement, why they participated and prisoners' commitment to change. The authors argue that engagement in a TC does not automatically derive a clear, homogenous causal effect but instead suggest that a treatment effect may be artificially derived from selection biases that allow entry to some whilst prohibiting other types of individual.

Reconviction studies utilising quasi-experimental techniques examining the efficacy of a community-based intervention (Addressing Substance-Related Offending) found that the program did not reduce recidivism compared with the matched sample group, with non-completers faring considerably worse than completers across both intervention and comparison groups (Palmer et al., 2011; Hollin et al., 2008b; 2004). A small-scale outcome study examining a prison-based version of Addressing Substance-Related Offending with 81 people in prison which did not examine reoffending rates did, however, find some evidence of change across a range of cognitive measures which were described as predictors of reduced offending (Crane and Blud, 2012).

However, in comparison, other studies found positive effects for substance misuse treatment. For example, 786 offenders receiving treatment in Canada as part of the Offender Substance Abuse Pre-Release Programme were matched (based on severity of substance abuse,

ethnicity, age, sentence length, offence type, release type, length of community follow-up) to a comparison group of 786 offenders not receiving treatment (Porporino et al., 2002). The outcome measure was ‘readmission’ including technical violations of release conditions and reconvictions. Statistically significant differences were noted between the treatment group and the matched comparison sample in terms of reduced readmission, reconviction and the level of violent offending. In addition, the study pointed to better survival rates among the treatment group once released back into the community (longer time taken to commit further crimes). The authors demonstrated that the largest effects were for people in prison with the highest level of substance abuse severity and the least extensive criminal histories. No effect was shown among other offender types (such as robbery, drug offences, shoplifting etc.). They conclude that interventions should therefore be calibrated toward the most “...*severe substance users who have committed violent offences, but who may not have particularly extensive criminal histories*” (Porporino et al., 2002; 1063). The study also highlights the importance of continuity-of-care as an intervening factor alongside the need to complete a course of treatment (completers did better than non-completers).

Continuity-of-care was a theme identified in an evaluation of an Amity prison TC that compared the outcomes of 425 people in prison (mainly stimulant drug users) receiving treatment with 290 people in prison in a control group (Prendergast et al., 2004). Engagement with treatment post-release (especially completing treatment rather than just attendance) suggested that there is a treatment dosage effect that combines prison and community treatment elements. Moreover, 1,501 graduates from a prison-based TC as part of the Sheridan Correctional Centre in Illinois, were matched to 2,858 comparator people in prison and a significant effect on recidivism was found, if treatment (through the TC) and continuity-of-care approaches were combined (Olsen and Lurigio, 2014). It should be noted

that, in this study, access to aftercare services post-release was mandated as part of the sentence plan and non-attendance was a revocation offence. Welsh and Zajac (2013) four-year follow up of 555 drug and alcohol misusers attending a TC matched to 998 comparator people in prison within Pennsylvania found significant effects on recidivism but not for levels of re-arrest or the extent of relapse. Age (with younger offenders more likely to reoffend) and employment status all predicted recidivism.

In addition, a meta-analysis of US-based research also suggested positive outcomes specifically for female offenders who engage in ‘substance abuse’ treatment programmes (Tripoldi et al., 2011), although it should be noted that the meta-analysis included a limited number of studies (n=6) often with very small sample sizes. In a similar vein, a study of a UK-based peer-based intervention that did not differentiate between drug or alcohol specific clients, and used quasi-experimental methods, found reductions in reconviction rates compared to a matched comparison group (Blatch et al., 2016). Similarly, a small study in Monroe County, New York, found short-term, non-violent offenders who received substance misuse treatment (n=84) were significantly less likely to be rearrested compared to a matched control sample (n=53) of people in prison (Turley et al., 2004).

Table 4: Reconviction Studies for drug and alcohol or ‘substance misuse’ interventions

Author	Country	Study Type	Sample	Prisoner Category	Reoffending Measure	Interventions affected change	Reoffending for People in prison with an AUD
Porporino et al., 2002	Canada	Quasi-experimental matched sample	786 treatment group matched to comparison sample	People in prison accessing Offender Substance Abuse Pre-Release Programme	‘Readmission’ to prison	Yes	Statistically significant differences between treatment group and matched comparison sample for reduced readmission, reconviction and the proportion of violent offending levels. Improved survival times to first offence also recorded
Zanis et al., 2003	USA	Naturalistic experiment	495 paroled to community treatment; paroled to no-treatment		Conviction of a ‘new crime’	Yes	22% of people in prison paroled to treatment reoffended, compared to 34% of the no-treatment group
Hollin et al., 2004	UK	Quasi-experimental matched sample	2,230 ‘experimental’ offenders in five interventions compared to 2,645 in a comparison group	Community sentence	Reconviction rate	Partial – only among treatment completers	Did not differentiate by type of intervention but overall, no treatment effect (apart from completers)

Prendergast et al., 2004	USA (Amity Prison, California)	Experimental sample based on TC and no-TC comparison	425 in TC group, 290 in comparison group	Medium security prison	Days to first illegal activity; self-report arrests; 12-month reincarceration	Yes	People in prison who completed prison and community-based treatment “performed significantly better than did those subjects who received lesser amounts of treatment on every measure” (p86)
Turley et al., 2004	USA (Monroe County, New York)	Quasi-experimental matched sample	84 treatment group and 53 matched group	Criteria to access treatment	Recidivism (re-arrest) at 6-and 12-months	Yes	No arrests at 12 months - 56.3% (treatment group) and 26.2% (comparison group)
Palmer et al., 2011	UK (England and Wales)	Quasi-experimental matched sample	319 adult male offenders. 141 receiving ASRO intervention, 178 substance misusers with no treatment	Community sentences	1-year conviction	Yes - but only for treatment completers	Reconviction rate for treatment completers (34.15%); non-completers (72.0%) and comparison group (43.82%). Increased time to reoffending for completers; shorter time to reoffend for non-completers compared to comparison group
Tripoldi et al. (2011)	US	Meta-analysis (6 studies)	Female offenders accessing broad OBPs some with drug and alcohol components. Only one study	Multiple	Recidivism	Yes	Overall female offenders 45% less likely to recidivate if they accessed OBPs. Large improvements noted for women in substance misuse treatment.

			was substance misuse focused (n=15)				
Friedmann et al. (2012)	5 USA counties	Prospective cohort	486 parolees randomised to collaborative behavioural management or standard supervision	Community sentence	Self-report and arrests for new charges and technical violations of parole,	Yes	Reductions noted in alcohol consumption; reduced crime rates for 'non-hard' drug use which included alcohol use
Crane and Blud (2012)	UK	Non-experimental	81 adult male people in prison receiving P-ASRO	Prison Category C	Battery of cognitive measures	Yes	Significant differences for impulsivity, control and social problem-solving ability. Self-reports suggest increase in motivation to affect change
Mitchell et al. (2012)	65 US, 4 Canada, 3 Australian, 1 UK and 1 Taiwan	Meta-analysis	Not reported	Multiple	'Substance abuse' treatment programmes	Yes	Covers 'recidivism' including all measures. Suggests TCs offer "modest but consistent" changes in reoffending.
Brunton-Smith and Hopkins (2013)	UK	The Surveying Prisoner Crime Reduction longitudinal cohort study	1,435 (1,303 males, 132 females)	Sentenced between one month and four years during 2005 and between 18 months and four years in 2007	Reconviction within 1-year	No – measured on attendance at treatment services	Reconviction rates for 'drug and alcohol detox' (yes attended 64%, no 62%); "accredited drug and alcohol programmes" (yes 58%, no 63%); "other drug and alcohol interventions" (yes 61%, no 62%)

Welsh and Zajac (2013)	US (Pennsylvania Department of Corrections)	Experimental sample based on TC and no-TC comparison	555 TC group and 998 comparison group	5 prisons across high-medium-low security	Reincarceration, re-arrest and drug relapse within 4-year period	Yes – effect on reincarceration only	Reincarceration 50.5% (TC), 59.3% (Comparison); re-arrest 52.3% (TC), 59.3 (Comparison); drug relapse 50.8 (TC), 51.2% (Comparison)
Olsen and Lurigio, 2014	US (Sheridan Correctional Center, Illinois)	Quasi-experimental matched sample	1,501 TC and 2,858 matched comparison group	Multiple (minimum- or medium-security prisons)	Recidivism rates through prison readmission	Yes – compounded by accessing post-release interventions	Treatment group who also completed aftercare programming had a significantly lower likelihood of readmission relative to the comparison group. Non-completers had a higher likelihood of readmission than the comparison group.
Blatch et al. (2016)	Australia (New South Wales)	Quasi-experimental matched sample	539 SMART group and 2882 comparison group	Multiple	Reconviction rates	Yes	Access to SMART significantly associated with improved odds of time to first reconviction (8%) and to first violent reconviction (13%) compared to controls. SMART group had significantly lower reconviction rates ratios for general (21%) and violent (42%) relative to controls.

De Andrade et al. (2019)	International	Systematic review of 49 studies	Did not pool data	Any	Multiple measures	Alcohol subsumed within illicit drug misuse	Not reported for people in prison with an AUD. Reoffending changes noted for illicit drug misusers.
Doyle et al. (2019)	International	Systematic review of 25 studies	Did not pool data	Any	Multiple measures	Alcohol subsumed within illicit drug misuse	Not reported for people in prison with an AUD. Reoffending changes noted for illicit drug misusers

4.4 Reconviction studies for alcohol-only interventions

There is a smaller literature for the effectiveness of alcohol-only interventions to reduce offending (largely based on UK findings representing how alcohol is usually viewed within a substance misuse prism elsewhere). Due to this lack of data, there has been an assumption of insufficient evidence to conclude whether alcohol treatment is effective in reducing post-release criminal behaviour; although there is more promising evidence in relation to interventions aimed at addressing drink-driving offences, which have been shown to be potentially effective (e.g. Miller et al., 2015; Palmer et al., 2012) with CBT a promising approach for hard-to-treat, pre-contemplative offenders (Quinn and Quinn, 2015). A similar finding was noted for individuals convicted for traffic offences who have an AUD and who accessed community-based English treatment (Willey et al., 2016). The need for an intervention for this group has been shown in drink-driving offender groups where nearly all offenders have been noted to have an AUD (Mullen et al., 2015).

A national English study extracted reports of offenders with ‘alcohol issues’ (defined as started an Alcohol Treatment Requirement based on Offender Assessments who accessed community substance misuse treatment) released from a prison with a sentence of under 12 months, or who commenced a court order (Community or Suspended Sentence Orders) between 2008-2011. The study found no changes in offending when compared to a matched group of similar offenders (Hillier and Mews, 2018). Similarly, a study on offenders with a community sentence in one English Probation area found no difference in offending following exposure to an alcohol-specific treatment order when matched to a comparison group (McSweeney, 2015). This study also showed no differences in the time taken to reoffend or the number of proven reoffences committed with treatment completion being a

major predictor of a positive outcome. In a prison context, a similar study of 435 male people in prison on a specialist alcohol treatment programme, found no statistically different rates of reoffending when compared to 254,501 matched non-treatment people in prison (Ministry of Justice, 2018).

However other studies have presented a more positive, if nuanced, picture of treatment effectiveness. A study of 564 male offenders on a community sentence were matched to alcohol treatment services. These interventions included low-intensity alcohol programs; Addressing Substance-Related Offending (the treatment group) with specific requirements attached compared to a control group. Offenders receiving alcohol treatment exhibited statistically significant reductions in offending, with the control group shown to be more than twice as likely to be reconvicted (Needham et al., 2015). A national analysis of reoffending rates among individuals in the community receiving treatment during 2012 (Ministry of Justice/Public Health England, 2017), found reductions in reoffending highest amongst the AUD-only cohort (57,892 individuals) in comparison with other treatment groups (opiate, alcohol and non-opiate, non-opiate only users). This level of reduced reoffending should be viewed cautiously as over half of AUD-only clients (54% including motoring offences) reported summary offences (low level rather than indictable) in the two years prior to treatment, in comparison to other treatment segments suggesting that this cohort may report less serious crimes than other types of treatment user. The same study examined reoffending among people in prison with an AUD and found only a slight reduction in the level of reoffending in the two years post-release compared to the two years pre-incarceration (from 1.0 offences per person per year to 0.8 subsequently). The authors did not test whether the difference was statistically significant but did rather ambiguously suggest that the changes

between treatment segments “*does not appear to vary significantly by substance type*” (Ministry of Justice/Public Health England, 2017: 21).

An English national prospective cohort study (Willey et al., 2016) showed that clients with an AUD in treatment at community services in England (including criminal justice clients and self or other referrals) reported lower offending rates by intervention type (mainly in-patient and pharmacological interventions). Treatment duration and whether they completed the course of treatment were also shown to be associated with improved outcomes. This study also suggested that there is a relatively high risk of reoffending for individuals known to treatment who participate in acquisitive crime and violent offending (Willey et al., 2016). Other reconviction studies relating to alcohol-specific interventions have focused on programs linked to addressing alcohol-related crime. In addition, a randomized controlled trial of 115 adult male people in prison allocated to either an alcohol-related violence intervention or a treatment-as-usual group found statistically significant differences in favour of the intervention at 17-months (Bowes et al., 2014). A small study of ten community offenders receiving the same alcohol-related intervention for violence found positive cognitive changes, reduced alcohol consumption and no reconvictions after an average of seven months post discharge from treatment (McCulloch and McMurren, 2008).

Unsurprisingly therefore, one review of offender treatments for alcohol found few rigorously sufficient studies to report on, leading the researchers to conclude that there was “*no consistently conclusive evidence for the effectiveness of a single intervention*” in part due to inherent methodological flaws (Roberts et al., 2007:11). This conclusion was supported by McMurren’s (2011: 909) systematic review of what works in the treatment of female offenders which concluded that: “*there is insufficient evidence to answer the question of*

what works with women who commit alcohol-related offences” although the study did emphasize links between alcohol misuse, violent offending and mental health.

Table 5: Reconviction studies for alcohol-only interventions

Author	Country	Study Type	Sample	Prisoner Category	Reoffending Measure	Interventions affected change	Reoffending for People in prison with an AUD
McCulloch and McMurran, 2008	UK	Prospective cohort	10 offenders receiving Control of Violence for Angry, Impulsive Drinkers intervention	Community sentences	Reconvictions on average at around 7-month discharge point	Yes	Cognitive improvements, reduced alcohol consumption and no subsequent reconvictions.
Ashby et al. (2010)	UK	Prospective cohort	81 offenders on a community order (Alcohol Treatment Requirement)	Community sentences	Reconviction	Yes	59 out of 81 offenders did not offend on completion of the treatment order
McMurran et al. (2011)	26 international studies	Narrative syntheses	Female offenders	Community and prison	Multiple measures	Not able to conclude	Evidence unable to conclude whether there is an effect
Palmer et al. (2012)	UK	Quasi-experimental matched sample	375 adult males convicted for drink-driving. 144 received Drink Impaired Drivers intervention, 231 in comparison group	Community sentences	1-year reconviction	Yes	No reoffending among treatment completers; 14% reoffending among treatment non-completers; 3.9% in comparison group
Bowes et al. (2014)	UK (Wales)	Experimental randomised controlled trial	56 people in prison randomly allocated to Control of Violence for Angry, Impulsive	Two Medium-security prisons	Reconvictions at 6- and 17-months	Yes at 17 months period only	No difference at six-months; 17 months treatment group reported 13% fewer people

			Drinkers group; 59 to a treatment-as-usual group				reconvicted for violence and 20% fewer reconvictions for 'any' offence.
McSweeney (2015)	UK (one probation area)	Propensity score match	182 treatment group matched to a 294 comparison group	Community sentence (Alcohol Treatment Order)	Reconviction at 1-year	No	No association between treatment exposure and reoffending; no differences in time to offend; number of proven offences. Completion of order main predictor of re-offending.
Needham et al. (2015)	UK (England)	Case control matched sample	Offender assigned to three alcohol treatment programs (n=141 per group with a matched comparison group (n = 141)	Community sentences	Reconviction over 1-year	Yes	Treatment groups showed significant reductions in reoffending. Comparison group 2.5 times more likely to reoffend.
Willey et al. (2016)	UK (England)	Longitudinal	Community-based treatment including criminal justice referrals (n=53,017)	Including some criminal justice referrals	Reconviction over 1-year	Yes	Reduced reconviction if completed treatment and if an in-patient or received pharmacological interventions. Lower also for drink-driving offences.

Ministry of Justice/Public Health England, (2017)	UK (England and Wales)	Longitudinal	57,892 AUD subjects across prison and community services	All categories and community services	Reoffending over 2-year period	Yes - but unclear whether statistically significant	Prison only group reduced offending from 1.0 from 1.0 offences per person per year to 0.8
Ministry of Justice (2018)	UK – 9 prison sites	Quasi-experimental matched sample using Propensity Score Matching	435 alcohol-dependent male people in prison with a medium-high risk of reoffending assessed between 2007-2017 matched to 254,501 comparison group	No prison category defined	Reoffending over 1-year period	No difference in reoffending compared to comparison group	37% reoffending rate in treatment group compared to 36% in comparison group; no differences in time to reoffend or frequency of reoffending
Hillier and Mews (2018)	England and Wales	Quasi-experimental matched sample using Propensity Score Matching	19,927 on a Court Order; 6,227 on a Suspended Sentence Order; 13,688 in a Community Order matched to 117,535 (Court Orders) 35,235 (Suspended Sentences) and 82,300 (in Community Order)	No prison category defined	Reoffending over 1-year period	No – A significant difference noted in the frequency of offending in the community order cohort only	Similar, non-significant rates of reoffending noted for offenders on all orders compared to matched comparison groups

Newbury- Birch et al. (2018)	International	Systematic review	11 papers reviewed across 9 studies	No prison category defined	Multiple measures reviewed	Not able to conclude	“Potential” to impact on alcohol use – unable to comment on any treatment effect due to methodological weaknesses and heterogeneity of measurements
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4.5 Reconviction Studies: Summary of Evidence

The evidence presented suggests a nebulous picture of treatment effectiveness, in part due to variations in methodology and difficulties in isolating alcohol from wider ‘substance misuse’ needs. Farabee and Prendergast (2002) argue that alcohol gets ‘lost’ when considered alongside illicit drug use especially as prison-based services are largely focused on treating illicit drug addiction (HM Inspectorate for Prisons, 2010; Duke, 2005). Despite alcohol use forming part of the ‘modest four’ (or ‘big five’ for female offenders) factors, alcohol consumption alone is not a clear predictor of future recidivism, rather contextual and other personality-based factors inherent within individuals will be associated with reoffending post-release. There is mixed evidence for the effectiveness of substance misuse treatment although there is some support for high-intensity interventions (e.g. Therapeutic Communities) incorporating continuity-of-care post-discharge. Moreover, drug use may be a stronger factor in predicting offending than alcohol consumption although there is a need to be cautious as some studies using individuals with an AUD-only diagnosis may report lower levels of offence seriousness in comparison with other treatment segments. There is a paucity of research examining reoffending for people in prison specifically with an AUD and those that do exist show a decidedly mixed picture of treatment effectiveness. Some studies demonstrate positive outcomes (Willey et al., 2016; Needham et al., 2015; Ashby et al., 2010) and others show no difference in offending rates with counterfactual groups (Hillier and Mews, 2018; Ministry of Justice, 2018; McSweeney, 2015; Bowes et al., 2014). It should be noted that these studies were across a range of custodial or community settings, evaluating different types of treatment with different sample sizes, all using different methodologies which prevent any conclusions being made.

Chapter 5: Key Concepts and Theories

5.1 Introduction

This chapter examines the factors that facilitate the prevention of criminal behaviour on release. This encompasses three domains: ‘desistance’, ‘recovery’ and factors underpinning the ‘treatment process’. Commentators have pointed out that definitions of desistance and recovery are fluid and in many ways desistance and recovery are flip sides of the same coin (Van Roeyen et al., 2017). It can be theorised that reducing or stopping drinking (to start one’s recovery) is the antecedent of reduced offending. Put another way, if an individual reduces their drinking to manageable levels then this should result in fewer offences being committed. Consequently, there will be a need to understand the drivers of change or the ‘active ingredients’ (Moos, 2007) of treatment. This chapter will present some findings relating to desistance, recovery as it relates to offenders in the criminal justice system, and some pointers relating to treatment processes that may facilitate behavioural change.

5.2 Desistance

The criminological literature has focused on understanding what makes offenders cease offending (the ‘termination point’) and the covariates that predict reoffending (e.g. Andrews and Bonta, 2010; Andrews and Downden, 2007). The definition of desistance has been subject to some debate and is considered poorly defined and adaptable to different contexts and environments (Best et al, 2017). These include placing desistance on a continuum from ceasing offending and ‘staying stopped’ (Maruna, 2001), to reducing the level of offending.

Kazemian (2007, p9) argues that this termination point is “*the last officially recorded or self-reported offence*”. Bushway et al. (2001: 500) rather argue that desistance is a “*process of reduction in the rate of offending (understood as an estimate of criminality) from a non-zero level to a stable rate indistinguishable from zero*” that recognises the potential for lapse and relapse (Burnett, 2004).

The lack of a clear definition for desistance creates problems with its subsequent measurement (for example, Kazemian (2007) cites 14 potential measures from the desistance literature). Bushway et al. (2003) highlight the dangers of relying on official records. For example, a one-year follow-up period assumes offenders commit crimes at the same level, creating what Kazemian (2007) called ‘false desistance’ whereby official recording has ceased but crime behaviour continues.

The desistance literature focuses on an offender’s characteristics such as age and their social environment with internal, cognitive processes that address changes in *perception* or personal narratives to create a new ‘life story’. McNeil and Schinkel (2016) suggest four main theoretical groupings: (1) Age and maturation processes that reduce offending as part of a person’s natural life history; (2) The importance of social bonds and ties of which the two main factors are the development of long-term relationships (e.g. marriage) and career or work (Sampson and Laub, 2005); (3) An internal narrative that allows an offender to change their life story to affect change; (4) Integration of routine behaviours that have an influence on behaviour.

Sampson and Laub (2005) utilise a broad life-course theory model to emphasize turning points that include significant personal life events including marriage, gaining employment

and military service. These events create social bonds to interrupt a criminal career and cause offenders to re-evaluate their view of crime. This model emphasizes childhood and the role of school, family and an offender's social environment. The importance of offenders' early years environment is cited as part of a social control theory that states human beings are intrinsically hedonists that require gratification of immediate desires (Gottfredson and Hirshi, 1990). Therefore, criminals will have greater proclivity to pursue hedonistic lifestyles including excessive drinking and drug taking. The authors argue that the absence of self-control due to "*ineffective child rearing*" (Gottfredson and Hirshi, 1990: 97) can explain some criminal behaviour. Moffitt's empirical analysis (1993) argued that there were two broad criminal trajectories – 'adolescence limited' (e.g. brief flirtations with crime) and 'life-course persistent' offenders who were more likely to have a poor family life, personality disorders and reside within a criminogenic milieu.

Commentators have argued that McNeil and Schinkel's (2016) four strands are inter-related with expectations of success (e.g. rehabilitation to stop offending) key to cementing permanent and fruitful social bonds that underpin change (Maruna, 2000). Maruna and Farrell (2004) describe *primary* (initial changes in behaviour) and *secondary* (shifts in identity) desistance, which are grounded in support from the wider community (social rehabilitation), judicial support and moral rehabilitation. Maruna et al. (2009) argue that institutions can create a 'pygmalion effect' where the high expectations of others (e.g. treatment workers) create an environment in which desistance may conceptually flourish. Underpinning behavioural change is a cognitive shift that offenders undertake to create a new personal narrative that emphasizes a prosocial personality. Zamble and Quinsey's (1997) study of people post-release highlighted the effect of social circumstances (structure) and decision-making (agency) as means to manage their lives in the community. People in prison who

exhibited negative reactions to barriers or obstacles were more likely to reoffend than those that had more positive thought processes. Maruna's (2001) Liverpool Desistance Study of male and female offenders on probation, created a group of 'persisters' and 'desisters'. Maruna found that both groups developed 'scripts' that framed their internal narrative. For persisters, there was a 'condemnation script' that emphasized helplessness, a perception of being a victim of circumstances beyond their control, whereas desisters felt in control "...and were optimistic that they could make it work" (Maruna, 2001: 147).

Similarly changes in personal narrative also emerges from the substance misuse literature, in a study of heroin addicts in recovery in a Scottish community setting, McIntosh and McKeganey (2000) found cognitive thought processes encompassing a re-imagining and distancing from a previous drug-taking lifestyle to a reconstructed identity as a non-user. Longabaugh et al. (2010) in the context of individuals recovering from problematic drinking, found a similar cognitive shift derived from avoiding social groups that drink, to accessing supportive networks. Paternoster et al. (2016) study of over 1,000 inmates in Delaware with a history of substance misuse, found people in prison who had been released and who redefined their identity away from an 'addict', had longer (survival) times to the next offence and were more likely to receive treatment or support than others who did not make this perception shift in identity. Best et al.'s (2011) study of 205 heroin and alcohol users in recovery in the community in Glasgow also found identity shifts a precursor to being in recovery, with alcohol misusers more likely to see their addiction as a life-long and incurable condition requiring daily management. This cognitive shift may be a double-edged sword however, as Maruna (2001) argues that, for some offenders, there was a "*wilful distortion*" (p9) to rationalise previous criminal behaviours away from a new, re-imagined persona.

Underpinning these internal narrative changes is a ‘theory of cognitive transformation’ (Giordano et al., 2002) that presents four change processes including, being open to the change; exposure to a specific change component; the imaging of a non-criminal identity that may be linked to starting a family or new relationship and making changes to ensure that an offender’s old life is no longer viable. The prison experience and treatment may help ‘knifing off’ offenders from their previous lives to allow for this cognitive re-appraisal (Maruna and Roy, 2007; Sampson and Laub, 2005). This process could include changing the narrative landscape around the past; social roles; past associates; educational or economic disadvantage; removing the stigma of being a criminal or addict and reducing the opportunities for involvement in crime (Maruna and Roy, 2007).

Best et al (2017) argue that ‘knifing off’ requires fundamental changes in social identity rooted in improvement in an overall quality of life that link to positive experiences post release that minimise the stigma of being an ex-offender (and substance misuser). These positive experiences encompass, for instance, connectedness, hope, sense of identity, meaning, and empowerment (Best and Wheatley, 2017; Best et al., 2017). Within a prison context, a ‘good lives model’ (Ward and Maruna, 2007) aims to imbue an offender with skills aimed at reintegration into mainstream society.

These approaches create an explicit role for interventions to act as drivers for change at both *primary* and *secondary* desistance points. Treatment should therefore be geared to the specific needs of the individual offender in contrast to a ‘one-size fits all’ approach. McNeill (2006) proffered a ‘desistance paradigm’ that emphasized the quality of the offender-professional relationship as part of a therapeutic alliance which may be antagonistic to a manualised treatment approach.

The review of the evidence suggests there may be dissonance between desistance theories and the desire to tailor services to an individual offender. Indeed, commentators have been critical as to how well desistance theorists have been able to operationalise their thinking (Maquire and Raynor, 2017). It is argued that the literature is too theoretical and lacks practical application to ensure changes are embedded. The importance of maintaining primary and secondary desistance can be demonstrated in a small qualitative study of people in prison on an Enhanced Thinking Skills programmes. This study found that, despite a person's motivation to engage with this intervention, non-completers complained of the intervention not being relevant to their needs; either too demanding or not demanding enough; and there were issues with the efficacy of group working (McMurran and McCulloch, 2007). Practical implementation problems are linked to prison churn, overcrowding, under-resourcing, the ability of prisons to deliver adequate services in an era of austerity and the recruitment of adequately trained and motivated staff, which may all hamper the implementation of these interventions (Maquire and Raynor, 2017).

5.3 Recovery within a Prison Context

Whilst there is a need to develop desistance and treatment processes to support practical behavioural change, as shown above, substance misuse services (including those for alcohol) have been required to operate under the rubric of 'recovery'. Conceptually, recovery describes individuals who no longer use substances after prolonged exposure (Laudet and White, 2010) although recovery has been placed within a wellbeing paradigm (Hser, 2007) that allows for the possibility of drug or alcohol use if it is part of "*a voluntarily maintained lifestyle characterised by sobriety, personal health and citizenship*" (Betty Ford Institute Consensus Panel, 2007; 221). In this model, recovery is staged through 'early sobriety' (the

first year), 'sustained sobriety' (1–5 years) and 'stable sobriety' of more than 5 years (Betty Ford Institute Consensus Panel, 2007). The UK Drug Policy Commission (UK Drug Policy Commission, 2008; 6) has, therefore, defined recovery as “*voluntarily sustained control over substance use, which maximises health and wellbeing and participation in the rights, roles and responsibilities of society*”. Underpinning these definitions is a realisation that recovery is a journey not a final, end state. Best et al. (2017) suggest two main conceptual models that underpin recovery including mutual aid groups such as Alcoholics Anonymous and TCs. Humphreys and Lembke (2014) further define key components of recovery practice to specifically encompass mutual aid, peer-delivered interventions and specific housing support for those in recovery.

‘Recovery capital’ has been conceptualised as an adjunct to the social capital requirements that form the social bonds desistance hypothesis (Sampson and Laub, 2005). In addition to social capital, commentators have argued for the existence of physical, human and cultural elements (Granfield and Cloud, 2001; Cloud and Granfield, 2008). Social recovery capital theorists (Granfield and Cloud, 2001) have also argued that individuals with strong associations outwith of their substance-using milieu will have better social outcomes (improved employment, financial security, relationships, and health). Links have been made also with sustained recovery and quality-of-life measures (Best et al., 2011).

For proponents of recovery, prison acts as a countervailing force (‘negative capital’) by forcing people in prison to adopt a machismo prison persona that is ‘anti-recovery’ (Cloud and Granfield, 2008). Although there is clearly common ground with desistance theories, much of the debate around recovery within prisons has focused on the perceived utility, acceptability and provision of substitute prescribing (e.g. methadone for heroin users) within

a prison setting (Asher, 2013; McKeganey et al., 2010). This focus is largely due to the debate being driven by political forces as described earlier in this thesis.

As with desistance, operationalising recovery and developing social capital within a prison setting has proved to be challenging, as there is confusion as to the meaning of all these concepts (Best et al, 2017). Studies of desistance and recovery amongst substance misusers have suggested that “*desistance is subordinate to recovery*” (Colman and Vander Laenen, 2012: 1). Desistance and recovery are considered distinct, dual processes and the mechanisms underpinning change have not been understood and are poorly conceptualised (Van Roeyen et al., 2017). Van Roeyen et al. (2017) suggest that whilst desistance tends to be defined as no longer committing crimes, incorporation of recovery has become confused between ‘clinical’ and ‘personal’ components. They argue that clinical recovery is measured by professionals’ monitoring of continued substance misuse (e.g. towards abstinence or free from dependency), whilst, as shown above, an individual’s personal recovery may still involve drug or alcohol use including use of substitute medication. Here, “*personally desirable outcomes*” (p619) and ongoing use of substances can be synonymous with recovery, but this becomes difficult to operationalise within a prison context. Although governmental and expert policy pronouncements have highlighted the need to emphasize wider holistic needs of an offender (e.g. the social capital requirements implicit within recovery), it is unclear whether prisons have adopted new ways of working other than marketing a recovery rhetoric (Duke, 2005; Duke, 2013). Best et al. (2017) conclude that changes in workforce practice (avoiding didactic interventions) and changes in the way reintegration are managed are the two components required to simultaneously address desistance and recovery.

5.4 Treatment or Intervention Components

It has been possible to show that people in prison respond positively to treatment within a custodial setting in terms of improved psychological functioning at different points in time whilst receiving prison-based substance use treatment (Welsh, 2010; Prendergast et al., 2002), suggesting that outcomes highlighted earlier in this thesis by NTORS may be plausible. It is possible to link to the desistance literature to explain how treatment processes may influence cognitive transformation (Giordano et al., 2002). As with desistance, an offender's self-perception of change and particularly, factors underpinning individual growth and socialization, are key factors that predict differences in recidivism for substance misuse offenders (De Leon et al., 2006). The 'Stages of Change' (or 'trans-theoretical') model of change (Prochaska and DiClemente, 2015) incorporates an overview of individual thought processes that can lead to behavioural change. Here, there are clearly demarcated staging points from 'precontemplation', for those who may not wish to change behaviours such as heavy drinking or do not recognize a problem; 'contemplation', the point at which individuals are desirous of making a change; 'action', whereby behaviours are modified; and finally, 'maintenance', whereby modified behaviours become ingrained and accepted. This is somewhat aligned to the theory of cognitive transformation (Giordano et al., 2002) identified within the desistance literature. Access to treatment is linked to the 'contemplation' and 'action' components, supported by future and on-going 'maintenance'.

However, there are few studies directly testing the theory's applicability to people in prison with the exception of violent offending (Howells and Day, 2006) and for offenders with mental health issues (McMurran et al., 1998). In one study of 257 incarcerated female drug users (El-Bassel et al., 1998) the five stages were broadly confirmed, and five related clusters

were created (denial, uninvolved, ambivalent, decision-making, and participation). One study of 615 offenders on a community sentence found self-reported anxiety and suicide ideation as predictors of successful treatment completion (Clark et al., 2014). The authors suggest that admission of mental health issues may help foster the “action” required to make a positive change especially in a prison culture “...where asking for help is considered a sign of weakness” (Clark et al., 2014; 838). Yet commentators have suggested that the Stages of Change model may not be applicable to offender populations and that the model may be over-simplistic of the nature of criminal behaviour by imposing unsuitable and artificial categories (D’Sylva et al., 2012; Burrowes and Needs, 2009; Casey et al., 2005). In a study of 337 people in prison in the US, recidivism and criminal thinking reduced as the symptoms of ‘substance use disorders’ increased (Caudy et al., 2015). This study suggests that clinical treatment may be needed for people in prison who are dependent and to specifically address criminal thinking. However, as Best et al. (2009) have shown, offenders reporting higher levels of criminal thinking can exhibit poorer treatment engagement, motivation for change and client functioning, suggesting a need to address criminality as a specific component of the treatment process.

5.4.1 *Therapeutic Alliance*

The effectiveness of OBPs has been called into question in terms of the quality and variability of provision (Day et al., 2013). One review (Day et al., 2013) has emphasized the role of the therapeutic alliance between client (person in prison) and therapist (prison treatment worker). Here, the therapeutic alliance was shown to comprise three components that encompass collaboration, the affective bond between client and therapist, and the ability to agree on treatment goals and tasks (Day et al., 2013). The authors conclude that person-

centred, collaborative and flexibly delivered programmes “*are likely to prove the most effective*” (Day et al., 2013: 632), alongside a need for enhanced approaches to staff training and supervision. The importance of the therapeutic alliance as a motivating factor in ensuring treatment retention has been shown in other studies of substance misuse treatment with prisons (Brocato and Wagner, 2008). Furthermore, key treatment attributes and practices were defined as including the effective use of authority; appropriate behaviour modelling and reinforcement; allowing the offender to develop problem-solving skills and enhanced relationship building with an offender that includes openness, warmth, empathy, enthusiasm, direction or guidance; and structure (Dowden and Andrews, 2004). The strength of the therapeutic alliance has also been shown to be pivotal in other studies of OBPs (Shapland et al., 2012; Bonta and Andrews, 2007; Burnett and McNeill, 2005).

5.4.2 Clinical Treatment Components

The importance of a person-centred approach is also found in research from ‘clinical’ treatment. Underpinning an offender’s need for a cognitive identity change to facilitate reductions in offending is an understanding of the ‘active ingredients’ that facilitate this change (Moos, 2007). Four overarching models are posited. Social Control Theory that emphasises the bonds to family or to wider society; behavioural economics or Behavioural Choice Theory that makes an argument for alternative, positive behaviours where alcohol consumption is a function of a lack of suitable alternative rewards; Social Learning Theory where the attitudes and behaviours of family members (e.g. parents) and peers act as role models to reinforce certain behaviours; Stress and Coping theory whereby alcohol consumption may be seen as a means to ameliorate every-day living conditions. From these models, core components of effective treatment are highlighted:

Table 6: Active Ingredients to Effective Substance Misuse Treatment

Social Control Theory	Behavioural Economics	Social Learning Theory	Stress and Coping Theory
Bonding or support	Use of rewards	Abstinence norms	Coping skills
Goal Direction	Participation in alcohol-free activities	Abstinence models (e.g. examples)	Self-efficacy
Monitoring/structure			

(derived from text of Moos, 2007)

Some of these ingredients make their way into another recipe for treating ‘substance use disorders’ (Belenko et al., 2013). Prison-based interventions should be of sufficient length especially for people in prison with comorbid diagnoses; they should build motivation and coping skills for resisting alcohol consumption and criminal activities; include a regime of monitoring, sanctions and rewards to manage behaviour; treatment should be based on collaboration between specialist substance misuse and prison staff to monitor progress; enhanced continuity of care with the community; integrated treatment for offenders with dual diagnosis needs and ensuring adherence to medical regimes as clinically required. Casey and Day (2014) add to the mix by suggesting four conditions are necessary to facilitate reductions in reoffending resulting from substance misuse treatment, including (a) clarifying the relationship between substance use and crime for each person in prison; (b) targeting of higher-risk offenders; (c) pharmacological treatment (which is linked with psychosocial support especially post-release); and (d) interventions that are cognisant of how offending relates to different substances used. Moreover, addressing an offender’s needs holistically,

through use of multi-modal interventions, has been shown to be effective (Gaes et al., 1999). This should encourage the development of sequencing of stepped approaches to care whereby clinical interventions may be deployed to stabilise an offender on arrival with more intensive interventions encouraged at some later point.

5.4.3 Treatment Systems

Day and Mitcheson (2017) argue that there is too much time spent proving the efficacy of stand-alone treatments as compared to understanding the dynamics of treatment systems encompassing organisational and staff attributes. US research has developed the concept of a ‘treatment process model’ that suggests positive outcomes (reduced drinking and offending) is a function of subtle interactions between services and professionals propagating change (organisational climate or culture), alongside peers, families, underpinned by societal norms (Simpson, 2004). A systematic review found that better organisational functioning, organisational climate and to a lesser extent, staff relations, are associated with enhanced staff/client relationships, and enhanced treatment outcomes (Kelly et al., 2017). US studies in prison-based environments have shown the importance of management leadership alongside staff characteristics including the range of skills and experience as measures that underpin effective treatment delivery (Makarios et al., 2014). One US study examining engagement with substance misuse services highlighted the importance of three interlocking factors including the offender’s motivation at the start of the treatment process, the interpersonal relationship with clinical staff and the characteristics of the intervention itself (Welsh et al., 2008).

5.4.4 *Individual Attributes*

Simpson (2004) suggests at the point of starting treatment, an individual's attributes including motivation for change, readiness for treatment and problem severity, interact with the treatment provider's attributes (resources, staff skills etc.) to create the conditions to facilitate behaviour change. This may be analogous to the 'primary desistance' concept highlighted above. The importance of 'problem recognition' and 'desire for help' have also been shown to predict therapeutic engagement in prison treatment (Rosen et al., 2004). One study from Holland of 638 people in prison, across a range of treatment programmes including drug and alcohol interventions, found that a previous history of substance misuse did not correlate with engagement or completion with an intervention; rather the importance of ensuring treatment-readiness assumed primacy (Bosma et al., 2016). Although the severity of need at intake has been shown to be a key intervening variable, Wooditch et al. (2014) show that, among a sample of 251 drug-using offenders receiving a community sentence in the US, reductions in crime were correlated to changes in criminogenic need (including levels of alcohol consumption).

At the point of release, the treatment process model fuses access to secondary support services (access to public health services and recovery communities) to cement changes (similar to secondary desistance). The role of motivation and acknowledging a substance misuse treatment need has been shown to facilitate prisoners' engagement with post-release treatment (Hamilton and Belenko, 2019). In addition, as shown in studies of OBPs, positive one-to-one staff-client relationships that foster enhanced client satisfaction have been shown to support treatment engagement and participation in both the US and UK (Best et al., 2009). Yet, perceptions of satisfaction, that should theoretically facilitate better treatment

engagement, have been shown to be nuanced and predicated around three constructs of interpersonal, treatment content and professional qualities based on past and present perceptions (Sondhi and Day, 2012).

Although the literature on treatment highlights the role of motivation and treatment readiness as key factors, for OBPs these factors are viewed by some as “*somewhat nebulous*” (Travers et al., 2013; 61), with a suggestion that motivation is an insufficient explanation of differential treatment outcomes (McGuire, 2006). Consequently, theories of individual offender change need to be located within the organisational environment provided within a custodial setting. This view suggests that the desistance literature misses a vital component to explain behaviour change of an offender, namely the health of the organisation delivering the change interventions.

5.5 Concluding Thoughts

The chapter has described the fundamental theoretical components that underpin offender-based treatment. Desistance and recovery theories aim to facilitate cognitive prosocial changes in a person’s identity, away from being a substance misuser or offender. Approaches to desistance and recovery have both been critiqued as overly theoretical that lack operationalising. A look at the treatment components required to facilitate these changes has included several possible ‘hooks’ for engagement, with the development of a therapeutic alliance between worker and offender seen as key. There is a suggestion that prison-based interventions should be placed in a wider organisational context to understand how systems create an environment in which treatment services operate.

The following chapter takes these themes of desistance and recovery and examines the perspectives of operational and strategic providers in prison settings. Particularly, to assess whether these concepts have face validity for those working in custodial settings. Following on this, the following chapters address the methodology and analytical strategy for this thesis. Chapter Seven presents an overview of the methodology and analytical approaches deployed for this thesis with reference to defining how a treatment effect will be determined. Chapter Eight introduces the use of quasi-experimental methods to determine a provisional causal treatment effect with reference to propensity score matching for ‘binary’ treatment and regression-based estimators for when more than one treatment is available. Chapter Nine presents the methods used including a detailed summary of the approaches used to link the various health and criminal justice datasets together.

Chapter 6: Qualitative Interviews with Strategic and Operational Stakeholders

6.1 Introduction

To supplement the quantitative analysis, a small number of qualitative interviews (n=11) were undertaken with strategic and operational leads to understand operational delivery approaches. The three strategic, policy leads from PHE and Ministry of Justice (n=3) were interviewed alongside regional and local operational providers covering psychosocial and clinical provision (n=5) and primary healthcare providers (n=3).

6.2 Method

A semi-structured interview schedule and participant interview sheet were created (Appendices I-II) revolving around three areas: a description of how prisons deliver treatment to people in prison with an AUD, what is meant by recovery and if relevant desistance, and what were the characteristics of the AUD population within their treatment service. Where possible, the interviews were recorded and transcribed although four interviews were undertaken in prison where recording was not possible due to restrictions on the use of recording equipment. Where audio recording was not possible, detailed shorthand notes were undertaken. The difficulties of undertaking prison-based qualitative interviews should be noted. In one instance, access to one prison was prohibited due to a prison-wide lock-down and one interview was undertaken in the family visits part of the prison. In other instance, an interviewee could not arrange access to office space in the prison and an interview was recorded in that person's car in the prison car park. Furthermore, the themes identified were

largely derived from interviews with practitioners. Discussions with strategic leads, whilst informative, tended not to yield insights into operational detail. Therefore, the themes are heavily operationally focused so it can inform ‘real-world’ interpretations of treatment delivery approaches. Interviews that were audio-recorded were transcribed verbatim. Hand-written notes were transcribed into Microsoft Word. All files included contemporaneous notes and reflections were also entered onto Word, including one hand drawn schema of the process of managing people in prison with an AUD described in detail by an interviewee. The files were ordered and analysed using NVivo v11.

A thematic analysis was undertaken using Braun and Clarke’s (2006) recommended six stage approach. The audio recordings of each interview were reviewed (Stage 1), and transcripts were created of all interviews including electronically recorded interviews and those undertaken by paper and pen. A coding frame to correspond to the topics within the interview schedule (Appendix I) was created (Stage 2) annotated line-by-line which allowed for familiarity with the data. This approach established a detailed understanding of significant issues that form the treatment process. Themes emerged from the interview transcripts based on reviewing contemporaneous notes and reflections made at the time of the interview (Stage 3). The emergent themes were reviewed for their “*internal homogeneity and external heterogeneity*” (Braun and Clarke, 2006: 20). In this sense, the themes were compared to the wider literature and in particular, issues relating to desistance and recovery as discussed in Chapter Five (Stage 4). The fifth stage involved defining and naming the themes identified and this process was supported by use of NVivo software that allowed themes and quotations to be grouped. The final stage (Stage 6) involved describing the themes which is provided in the following section.

6.2 Findings from the Qualitative Interviews

Three themes were identified from the interviews. First, that prison interventions are guided by public health priorities and approaches rather than specifically by the aim of reducing reoffending. This has implications for a criminal justice-based treatment system, in so far that *any* form of treatment (clinical or psychosocial) is assumed to automatically translate to improvements in reoffending post-release. The second theme focused on creating a recovery orientated treatment system within a custodial setting. The challenges of operationalising recovery/desistance in a prison setting were highlighted and discussed. Finally, stakeholders highlighted that people in prison with AUD were not a homogenous group, rather segments of the AUD population emerged grouped by dependency or non-dependency. Each type of drinker will bring different and sometimes conflicting, challenges to delivering treatment in a prison setting. The following section will present each theme in turn.

6.2.1 *Public Health 'Turn' for Prison Interventions*

The strategic policy leads described how the Ministry of Justice divested from drug and alcohol treatment (e.g. direct delivery of OBPs). This was primarily due to austerity which in turn created a change in strategic direction towards NHS commissioners focused on health interventions. Whilst the Ministry of Justice remained part of a tripartite approach to commissioning, this was perceived to be largely notional, and was driven by local needs as determined by NHS commissioning arrangements.

For operational teams, there had been widespread dissatisfaction with CARAT services. The CARAT delivery model was perceived as restrictive, inflexible and non-therapeutic.

Interviewees suggested that the manualised approach was geared to meeting targets focusing on numbers rather than on creating a therapeutic approach. For these interviewees, the interventions did not adhere to the RNR model - prisoners were insufficiently risk assessed to calibrate interventions by intensity, the model did not meet need and lacked responsiveness. The CARAT/OBP model was seen as suffering from a fundamentally flawed design rather than from an 'implementation gap':

"It was bums on seats that mattered nothing else, and forms to fill which was at the expense of spending time working with clients. You were not allowed to engage in discussions in group work, which was frustrating to all of us, as you can imagine. Most prisoners knew what we were going to say, they had heard it so many times by then that it lost any impact it may have once had. It is much better now when we have the freedom to deliver what our prisoners need."

[Treatment Provider]

Healthcare teams described pathways for people in prison with AUDs to access clinical and psychosocial interventions. All people in prison were health-assessed (taking up to an hour) on arrival and questions on alcohol consumption using AUDIT screening prompts were common. At this initial assessment and for those arriving from the courts (Category B prisons), prisoners who were determined to be at risk of alcohol withdrawal or other related conditions were seen immediately by a General Practitioner for an initial consultation (often confirmed by a separate substance misuse specialist). For these individuals, a detoxification package was initiated that included pharmacological support and access to a range of psychosocial interventions including OBP-type programmes and one-to-one 'key-work'.

For people in prison not in immediate need of clinical support, prisons generally reported using the shorter version of AUDIT (AUDIT-C) to screen problematic use at reception, whereby the full ten questions of AUDIT¹⁵ would be initiated (some prisons did use the AUDIT-10 as the main screening tool). Lower risk prisoners would be offered extended brief interventions. Prisoners deemed clinically dependent but not in withdrawal would be referred to case-managers to receive the range of pharmacological and psychosocial services as required. People in prison could also access treatment through their sentence plan, but it would be expected that a clinical assessment would also be carried out first, thereby creating a temporal logic to treatment (e.g. clinical needs → psychosocial input). Moreover, the ‘risk’ assessment process can be viewed as focusing on *clinical* aspects rather than the risk of reoffending. For these teams, ‘risk’ primarily was overdose risk post release and treating blood-borne viruses.

Healthcare teams described the process as driven by the ‘Orange Book’ clinical guidelines (Department of Health, 2017) and local commissioning arrangements that systematised an approach that could be delivered across all prisons (for example, nationally or regionally). Clinicians reported satisfaction with this model, as previously local GPs had ‘power’ to create idiosyncratic clinical pathways. This allowed for a degree of uniformity to be established that would be comparable to community provision.

Prison treatment teams described the psychosocial interventions offered to prisoners. Entry to PSIs was by criteria (usually clinical need or mandated by their sentence) and the interventions were broadly a mix of cognitive behavioural and motivational therapies. Risk of reoffending did not form part of the calculus for determining treatment dosage. Some

¹⁵ Strategic leads cast doubt whether screening was efficiently undertaken across all prisons

programmes were abstinence-based (e.g. revolving around Twelve-Step philosophies) but all teams stated that the interventions offered were person-centred (unless mandated by their sentence plan or there was an acute clinical need). Some prisoners accepted abstinence as an end goal, often as part of starting a ‘new life’, and for others, there was a desire to manage their drinking in specific contexts - using strategies to avoid ‘triggers’ that may lead to criminal behaviour. Treatment teams described using evidence-based interventions including brief interventions and “ITEP maps”¹⁶. These focused on exploring the antecedents and causes of offending rather than just imparting health information.

Most interviewees highlighted issues with continuity-of-care post release. Although this had improved due to strengthened commissioning arrangements that allowed a single provider to manage prison and community services, there were still problems with information-sharing, incompatible computer systems between prison and community, and an overreliance on outdated technology (e.g. facsimiles). Links with the privatised CRCs were perceived as poor. The links described between prison and community services were often based on personal relationships and informal communication channels that broke down when staff or processes changed. This was compounded by prisoners who ‘disappeared’ post-release. Here, some prisoners who previously had appeared to be motivated to access services did not arrive and were uncontactable (even when the same treatment service was in the community to follow-up referrals).

¹⁶ International Treatment Effectiveness Project. These are mind maps known as ‘node-link maps’ which are cognitive tools based on the visual representation of information.

6.2.2 Recovery-Based Prison Treatment

The interviews discussed what recovery was from a treatment perspective and how this was operationalised. Interestingly, drug and alcohol staff (less so for clinical teams) appropriated the *language* of recovery – citing the need to develop “*recovery capital*” or “*social capital*” to facilitate change. Yet for many interviewees, recovery was associated with brokering access to external services:

“We always have tried to plug people into services when they leave, from getting a GP or making hospital appointments and getting their housing sorted and all that as well as appointments with treatment and setting up rehab for them sometimes. I mean, you can’t do it all, but you try to do as much as you can as its part of your job. It’s all part of their recovery or rehabilitation or whatever you want to call it.”

[Treatment Provider]

Moreover, recovery was not just a simple abstinence versus continued drinking dichotomy. Interviewees highlighted the need for a person-centred approach to avoid the uniformity in approach that characterised CARAT OBPs. As stated above, there was recognition that whilst some services had an abstinence-based philosophy, there was acceptance that many prisoners would carry on drinking back in the community and that the context and potential triggers had to be identified.

6.2.3 *Dependent versus non-dependent AUD segments*

Stakeholders were asked about their perceptions of whether differential segments existed. Perhaps reflecting the nature of the screening tools used, interviewees highlighted a ‘dependent’ and ‘non-dependent’ split. Non-dependent drinkers were characterised as having drink-driving convictions alongside those whose drinking was associated with violent behaviours. Although not a homogenous grouping, these prisoners were perceived as more likely to be compliant with treatment and therefore considered less likely to reoffend.

Dependent drinkers were perceived as more complex, with heightened physical and mental health needs who often had a range of acute social needs from poor housing, fractured family relationships and likely to be treatment resistant. Offending patterns were more fluid than with drug users (e.g. covering a wider range of potential offenses). At the apex of this group were homeless street drinkers:

“Street drinkers are the hardest to work with...[you have to] spend time to socialise them into [the] prison regime. They have massive health and hygiene problems and you even have to teach them how to use the toilet....these men have been used to urinating when and where they want and we have to teach them to start again that they can’t live like this and get them to comply with the regime. This is all before we have begun talking to them about their alcohol use, their lifestyles and how it fits with it [their offending]”

[Treatment Provider]

Dependent drinkers were described as “*just lost*” where placing individuals within stages of cognitive behavioural change did not apply. For street drinkers who were likely to be

convicted of petty theft or nuisance crimes, there was limited opportunity to develop recovery capital or transformative hooks relating to desistance; rather time was spent addressing immediate chronic health concerns. This led to treatment providers placing drinking within a lifestyle (including access to blood-borne virus vaccinations) or life-skills paradigm rather than focusing on offending. For these drinkers there was acceptance that there were limited treatment options that could promote desistance from offending.

Dependent drinkers were also seen as having different issues whilst in treatment compared to drug users. A “*hierarchy*” was described whereby drug users “*looked down*” on drinkers which affected group work dynamics. Some interviewees suggested that prisoners with an AUD were dismissive of psychosocial interventions, suggesting that these approaches were designed primarily for drug users. Others highlighted the absence of a managed medication regime that could ensure compliance with treatment:

“Drug users have methadone to keep them engaged. It’s not the whole story but it helps us work with them and gives them and us a focus to work with. Alcoholics don’t have the same set-up and we have to be more creative in keeping their attention”

[Treatment Provider]

The interviewees suggested there was a higher probability of disengagement among prisoners with an AUD compared to drug users in treatment due to this reason. Also, there were some interesting insights into how dependent drinkers viewed their addiction compared to drug users:

“[dependent drinkers] are more likely to own their addiction. It is more personal to them and is not the same for anyone else, it’s their problem unique to them and to them only. It makes things like group work harder. Drug users are more likely to blame the drugs, drinkers say other problems are why they have gone bad not the alcohol if you know what I mean. Divorce, job loss and the like. This means they view it [their addiction] differently”

[Treatment Provider]

This suggests that treatment providers cannot offer a single approach for treating drug users and those with an AUD. Interviewees also highlighted the impact of austerity that prevented prisoners from accessing services due to changes in regime. Staff suggested that this affected the therapeutic nature of their interventions – for example, having to “*chase*” prisoners on the wing rather than providing a service in a confidential office space. Changes in financial resourcing also were viewed to affect the time available for high intensity programmes although staff emphasized that they did try to compensate through more one-to-one ‘key-work’.

6.3 Concluding Thoughts

The qualitative interviews highlighted an overarching issue with delivering substance misuse treatment in a custodial setting. Namely, the ‘turn’ towards a public health focus. Following Ministry of Justice divestment in CARATs, the void has been replaced by public health commissioned services, all of which use health-related process (such as clinically guided risk assessments) that focus on a person’s immediate health needs. Risk of offending is not included within the risk assessment process, nor is it incorporated within Clinical Guidelines (Department of Health, 2017).

The complexity of delivering recovery-based interventions for alcohol misuse was also highlighted. Interviewees stressed broad acceptance of drinking post-release which could be addressed by health promotion approaches. Intensive, cognitively based approaches based around CBT were redundant in this environment, where people in prison were often held for short periods of time. Instead, interviewees suggested it was a more efficient use of resources to focus on health promotion which could be delivered quicker and cheaper than other forms of behavioural programmes. Moreover, dependent drinkers were perceived as particularly problematic, with stepped-care interventions emphasized, addressing immediate clinical needs (e.g. health conditions) over reoffending. This was viewed as a pragmatic response to limited resources and the narrow window of time available. This finding runs contrary to the conclusions from Chapter Five that examined the theoretical underpinning of desistance and recovery concepts. Cognitive transformation (Giordano et al., 2002) to create new social identities whilst theoretically plausible, were seen to have little salience amongst stakeholders when faced with time and resource constraints in the treatment of often problematic and highly complex individuals.

The dissonance between theory and practice was further highlighted in discussions about the unique nature of individuals with an AUD. There was a perception that those diagnosed with an AUD had different levels of cognitive awareness regarding their drinking compared to illicit drug users. It was perceived by stakeholders that for people with an AUD, there was a lack of awareness that their drinking was the cause of their offending, rather external events (such as relationship breakdown, job loss) was the causal factor. Consequently, there was a perceived sense of ambivalence to the efficacy of certain psychosocial approaches such as group work. This creates difficulties in establishing new social identities although as Best et

al. (2017) contend this requires a transformation of operational practice and services available post-release.

It is argued that an overarching public health prioritisation of clinical treatment is a pragmatic response to treating complexity in short-time frames. Clinical staff will triage and default to clinical good practice emphasised in Department of Health's Clinical Guidelines (2017). This is also a reflection of longstanding dissatisfaction with the CARAT delivery model that was notionally based on RNR principles, but as highlighted in the interviews, was perceived as too inflexible and rigid. These constraints will limit more intensive cognitive approaches that underpin RNR, desistance and recovery. It is hypothesised that this model of care assumes primacy in substance misuse treatment in English prisons, and this assumption will be explored in later chapters.

Chapter 7: Methodology and Deriving Provisional Causality

7.1 Introduction

This chapter will provide an overview of the methodologies deployed to determine provisional causality. Specifically, the thesis will determine a treatment effect which is the provisional causal effect of a binary (yes-or-no) treatment on reconviction using propensity score matching. It has been noted in the literature review, that evaluations tend to focus on treatment as a homogenous entity or a single (often small-scale) intervention. Following on from this determination of a treatment effect for binary treatment, this thesis will deploy additional quasi-experimental methods using regression-based estimators to identify whether more than one treatment type can also be shown to have a treatment effect on recidivism. A method of establishing provisional causality for a binary treatment system will be compared to outcomes for its multicomponent parts.

7.2 Measuring Treatment Effects: The Evidence

The effectiveness of substance misuse treatment has been largely predicated on prospective cohort studies of community samples in the United States (e.g. Simpson et al., 1997; Craddock et al., 1997; Hubbard et al., 1989; Sells et al., 1980). This approach has been translated to other English-speaking countries including the UK (Gossop, 2015, Donmall et al., 2012; McKeganey et al., 2006), Ireland (Comiskey et al., 2009) and Australia (Ross et al., 2002). In these designs, interviews are conducted with service users at a baseline (T_0) corresponding to assessment into treatment and the outcomes of interest are measured at points from 6-months onwards (T_1). As shown in the introduction, these studies have

consistently demonstrated statistically significant improvements in self-reported outcomes (incorporating reductions in offending) at follow-up. These positive changes also hold for criminal justice referrals into community-based treatment services (Jones et al., 2009; Skodbo et al., 2007).

7.2.1 Provisional Causality

However, as also previously shown, these positive outcomes have not always been replicated throughout the criminal justice system, largely due to the heterogeneity of the populations being studied/the point at which treatment is delivered (e.g. people in prison, probation, at arrest), the methods deployed and selection effects (that certain types of offender may engage in treatment). It is also likely that criminal justice populations have greater vulnerabilities and exhibit riskier behaviours, including extreme levels of drinking, than their community-based counterparts. This may imply the possibility of differential treatment outcomes dependent on whether the person is treated within the criminal justice system or within the community.

A major issue with the evidence derived from community-based studies is the problem of being unable to fully demonstrate causality. Shadish et al. (2002) suggest that a causal relationship exists if cause precedes an effect; cause is related to an effect and there is no plausible explanation for the effect, other than the cause. Rubin (1974) describes the ‘counterfactual model of causal inference’ as when an outcome occurs if treatment is present, and absent when the treatment is absent (and it can be shown that no other confounding factor affects that outcome). In the range of prospective cohort designs, whilst the outcome of changed behaviour is likely, it cannot be proven that there is no other component that has a positive effect on treatment outcomes.

Cohort studies also have other limitations that prevent a causal inference being made (noting that existing studies have focused on opiate addiction with AUDs placed within poly drug use). The use of eligibility criteria creates selection biases at T_0 and T_1 . In the US, the pivotal Drug Abuse Treatment Outcome Study oversampled larger treatment agencies at the expense of smaller, rural and atypical services (Ashton, 1999). Selection bias may occur at T_0 as service users who have been recruited to engage with the research process may be the most stable, compliant and motivated to change. This may be compounded by those cohort studies (e.g. NTORS) that pragmatically used treatment staff to recruit the treatment sample. It is possible that those selected for these studies may be more likely to be those with good relationships with the treatment provider and therefore more likely to exhibit positive outcomes. Those that refused or were deemed ineligible were excluded from selection. This creates the possibility of biasing the sample towards those most likely to engage with treatment. Attrition biases also occur by being unable to follow-up all service users at T_1 and beyond. Around 30% of service users lost to follow-up as part of NTORS tended to be younger and more prolific heroin users (arguably those less responsive to treatment), and nearly three-quarters of the Drug Treatment Outcome Research Study (Jones et al., 2009) sample could not be re-interviewed at 12 months. Ashton (1999) suggests that for Drug Abuse Treatment Outcome Study, the cumulative effect of attrition at baseline and follow-up could nearly halve the published follow-up rate. Although statistical adjustments can be calculated to reweight the treated population to factor in attrition, these analyses were not always undertaken.

Other biases could also affect the nature of the outcomes. Re-interviews at T_1 could reflect social desirability bias (Kiecolt-Glaser and Murray, 1980), such that an interviewee may give a response that an interviewer may want to hear. This may be particularly true of criminal

behaviour where few studies cross-validated self-reported offending rates with official statistics (compared to urine or hair analysis that could confirm drug use). Publication biases may also subconsciously occur as most of the academics involved in these studies are health-trained professionals, working in public health sponsored university departments, commissioned by the Department of Health, publishing in health-orientated journals – where the null hypothesis of no treatment effect may be considered an ‘undesirable’ outcome.

Cohort studies using varying recruitment approaches have been replaced more recently in England, by reliance on administrative data sources – the National Drug Treatment Monitoring System (NDTMS). Secondary analyses of administrative data overcome issues with studies rapidly being out-of-date (e.g. NTORS is around a quarter of a century old) and eliminating some of the selection and attrition biases identified above. Three studies focusing on AUDs have used this approach (Peacock et al., 2018; Eastwood et al., 2018; Willey et al., 2016). Treatment staff update monthly each person’s record, allowing for a cost-effective mechanism to monitor treatment outcomes. Yet these studies are limited by the information available which tends to be basic socio-demographic descriptors and process details (e.g. type of treatment available). For alcohol, there is also limited information on severity of need captured within NDTMS.

Use of treatment staff capturing information on service user outcomes may be affected by ‘sponsor’ bias (Lexchin, 2012) whereby staff may be incentivised to minimise negative outcomes (for fear of funding etc.). Offending data are captured on NDTMS through a stand-alone ‘treatment outcome profile’ tool, but this measure, asked by treatment staff, may also suffer from a form of ‘social desirability’ bias (Kiecolt-Glaser and Murray, 1980). Offenders may be required to attend treatment as part of probation supervision, and it would not be in

their interests to admit offending which could breach the terms of their release conditions.

Also, the point at which the treatment outcome profile is administered (at the 12-week period after first assessment) will not fully capture changes in behaviour beyond this period.

These methodological limitations are echoed in the literature examining Therapeutic Communities (TCs) in the US which have been shown to have a modest treatment effect in reducing recidivism (Mitchell et al., 2012). The lack of controls, selection and attrition biases are compounded by heterogeneity in the outcome measure used across studies (variations on reconviction, re-arrest and representation to prison) and the low statistical power associated with these studies. For example, in England access to a TC is based on criteria that select a certain type of person. This includes evidence of being emotionally stable, drug-free (including not using any form of pharmacological intervention) and having no diagnosed mental illnesses (including evidence of self-harm). These selection effects also have been shown to influence evaluations of TCs where selection criteria have resulted in samples based on volunteers who were sufficiently motivated to start treatment or engage in post-release support (Zhang et al., 2011; Olson et al., 2009). As shown earlier, Welsh and McGrain (2008) argue that treatment readiness is a key factor associated with engagement. Davidson and Young (2019) argue that TC participants experience little change in engagement. Rather, engagement with the programme changed how they framed their treatment experience. For these participants, they were able to derive meaning from engaging in treatment, which in turn positively affected their commitment to behavioural change. The authors argue that engagement in a TC does not automatically derive a clear, homogenous causal effect. Rather they argue that a treatment effect may be derived from selection biases that allow entry to some whilst prohibiting other types of individual.

Deriving a consistent message from the literature on TCs is heightened by other biases. Compared to England and Wales, the US criminal justice system separates offenders by seriousness of offence through a federal prison compared to local jail system. Recidivism may be influenced by the type of custodial setting (a focus on less serious offenders may result in a greater chance of reduced reoffending). The outcomes may also be influenced by “*glaring differences*” (Welsh, 2007: 1494) in how TCs are implemented across different criminal justice jurisdictions. Although attempts have been made to reconceptualise TCs within ‘Drug Recovery Wings’ in UK settings (Lloyd et al., 2017; Powis et al., 2014), there is little comparability in operational design. Finally, the treatment samples in TCs are not comparable to UK prisons as there is a greater prevalence of stimulant (cocaine, methamphetamine) use amongst people in prison, and the prison population is heavily skewed towards non-white populations.

7.2.2 *Intention-to-Treat*

There is some debate as how best to manage the analysis of those individuals who receive treatment or an intervention. Evaluation studies have tended to focus on individuals who complete treatment only – known as ‘treatment as received’. Treatment received is seen as an ideal as it reflects the results of treatment *as it should happen* – in other words, measuring the effectiveness of an intervention is considered only valid when one looks at those who complete a course of treatment; otherwise there is a dosage effect that would not be representative of a treatment programme. But in its focus on those who complete their course of treatment only, our understanding of the components underpinning treatment will be compromised. Wormith and Oliver (2002) show the complexities of categorising non-completion. The authors create a typology that encompasses an administratively based exit

which may include release or transfer, agency-initiated expulsion such as due to disruptive behaviour or client-initial disengagement which includes personal reasons for dropping out of treatment (for example, psychological factors that may make an individual resistant to treatment).

In a systematic review of 25 studies of OBP non-completion in relation to personality disorder, McMurran et al. (2010) identified association with static factors (young age), perceptions (poor problem recognition), and therapeutic factors (problems related to therapeutic alliance). In a meta-analysis (Olver et al., 2011) of all OBPs, ethnicity, single marital status, younger age, unemployment, low-income levels, and lower educational attainment were all significantly associated with increased attrition from OBPs. Offenders were shown to also present with specific responsivity issues such as poor motivation and disruptive behaviour. The importance of drop-out from treatment has been shown among a cohort of individuals known to substance misuse treatment in the community (Ministry of Justice/Public Health England, 2017). They found that whilst drop-outs from treatment were reoffending less in the two years following treatment entry compared to the two years prior, they did so at a less pronounced rate (21% reduction in reoffending compared to 46% reduction if they successfully completed treatment) (Ministry of Justice/Public Health England, 2017). A systematic review of treatment completion and non-completion suggested that engagement is a mix of internal cognitive, affective and behavioural factors and external components including how well the intervention was implemented, treatment availability, levels of support and resourcing (Sturges et al., 2016). A meta-analysis of sixteen offender behaviour programmes found that overall, non-completers are significantly more likely to be reconvicted in comparison to offenders in an untreated comparison group, although the authors point out that methodological variations were unable to ensure an offender's level of

risk of offending was evenly distributed across both samples (McMurran and Theodosi, 2007). The authors conclude that for high-risk offenders there may be an interaction effect, resulting in a positive outcome from treatment for some and a negative one for others, although the authors were unclear as to the nature of this effect.

Despite this, the interaction effect with treatment may compromise components discussed in the literature review (Chapter Five) emphasising the necessary ‘active ingredients’ of effective treatment programmes (Moos, 2007). One US randomised trial of a programme aimed at addressing intimate partner violence found alcohol binge drinkers less likely to be compliant with treatment, but this effect could be moderated by use of motivational interviewing techniques (Crane et al., 2015). Porporino’s (2002) matched sample study of people in prison receiving substance abuse treatment in Canada highlighted four factors that need to be considered in the design of studies including: motivation, drop-outs, removal of unmotivated participants from a treatment programme and exposure to other interventions including access to services post-release (Porporino et al., 2002). Whilst there are few studies probing perceptions of interventions received, what exists suggest nuances within a person’s thinking. One small qualitative study, examining completers and drop-outs from an accredited general offending programme amongst probationers (Enhanced Thinking Skills), suggested that non-completers were motivated to undertake treatment but perceived the intervention as irrelevant to their needs. For some dropouts, the nature of the programme itself determined the outcome by either being too demanding or too easy, alongside the perceived appropriateness of creating a therapeutic environment using multi-personal groups rather than one-to-one interactions (McMurran and McCulloch, 2006).

Prisoner satisfaction with prison-based treatment programmes is rarely an outcome measure, despite its association with positive outcomes (Simpson et al., 2009). One study of opiate users receiving clinical treatment across prisons in England found complexities hidden within perceptions of service satisfaction. These nuances included, framing their current treatment in the context of previous experiences; how far (or to what extent) the service was considered professional and appropriate to their specific needs, alongside the quality of the interpersonal relationship fostered with the relevant worker (Sondhi and Day, 2012). So, whilst there is evidence that levels of motivation and treatment-readiness are key factors predicting positive substance misuse treatment outcomes (Simpson et al., 2009; Welsh et al., 2008), there is some scepticism of its prognostic capability in relation to generic offender behavioural programmes in favour of ensuring fidelity to how a treatment programme is delivered (Maguire et al., 2010).

In comparison, studies have also considered an ‘intention-to-treat’ (ITT) approach that includes all individuals subject to treatment regardless of differential levels of treatment dosage. The difference between those who engage in treatment and an ITT sample has been summed up as: “...*the difference between testing a policy of providing something to a group...and a theory about the effect of actually taking up the offer*” (Sherman, 2013: p12). Some studies have analysed interventions using both approaches. In one study of community-based accredited programmes aimed at general offending, the ITT approach found no treatment effect when compared to the comparison group (Hatcher et al., 2012) but the results changed when compared to those who engaged in treatment. This showed in-group differences with non-completers twice as likely to be reconvicted in comparison to the matched group. This differential has been shown to be problematic as it may mask the identification of positive outcomes for individuals who do engage with the treatment or

intervention (Hatcher et al., 2012; Hollin, 2008b). Consequently, commentators have suggested that there is a need to understand who benefits from treatment (and who does not) as a means to improve service delivery (Friendship et al., 2003). Commentators have concluded that:

“The least bad solution is probably to carry out an “intention-to-treat” analysis and analyse all those initially assigned to treatment” (Farrington and Davies, 2007: 24-25).

The treatment process that underpins this thesis creates problems in establishing an ITT approach. As prison-based treatment is a rolling, ongoing process with potential access to multiple components (pharmacological treatment and PSIs) there is often no clear start and end data. This differs from OBPs where there are defined structures and sequencing of treatment. The principle of treatment equivalence has created a system whereby any individual engages in treatment from the point of initial assessment on arrival. This engagement will be health-based and aimed at addressing immediate, clinical needs. As shown in the previous chapter, access to PSIs occur in relatively short-time frames following arrival into a prison. The rolling nature of treatment reduces the viability of structured programmes with a beginning and end. Although these still exist, most PSIs will be delivered on a one-to-one basis, with group work sufficiently generic that any individual can join at any time during their sentence. Consequently, the thesis will use the point at which a person is discharged from prison as the conclusion of their treatment, regardless of whether they have completed treatment. The advantage of this is that it replicates ITT approaches. Therefore, all people in prison were included within a treated sample regardless of whether they ‘completed’ treatment or not.

7.3 The Need for Experimentation: Calculating Provisional Causality

Experimentation has widely been perceived to be the gold standard for evaluating an intervention across medicine, social science and economic disciplines, as it is able to comment on causality. The development of randomisation occurred during the 18th and 19th century with attempts at ensuring any treated group is similar to a control (Chalmers, 2012). Here, subjects are randomly allocated to a treatment group or a no-treatment group, and these two groups are weighted ('controlled') to ensure that the populations in both groups are similar (e.g. by socio-demographics; levels of need etc.). Approaches in medicine used 'blinding' to avoid unconscious biases, which was supported by use of placebos to simulate the effect of receiving a clinical intervention (de Craen et al., 1999). Blinding remains a key aspect of randomisation that cannot be replicated using alternative designs. True randomisation can also carefully calibrate differences between a treated and non-treated group. Compared to alternative designs such as quasi-experiments that rely on the availability of administrative data, researchers are able to create balanced treated and non-treated groups. This can be achieved by primary interviews with all subjects that reduce attrition experienced when matching other datasets. This also allows for better control of the research environment which also allows for replicability (Ioannidis, 2015). As it will be shown, it is a contention of this thesis that opaque researcher decisions when undertaking quasi-experimental methods using administrative data will result in distorted treatment effects which cannot be replicated.

Yet experimentation in medicine has been criticised for underestimating operational constraints that do not distort the context in which an intervention is delivered (McKee et al., 1999; Britton et al., 1999; Black, 1996). Experimentation in its purist form may impose unnatural processes on the treatment delivery model by being 'top-down' in nature and fail to

adequately describe complex or multi-layered interventions. Patients and clinicians may have preferences for the treatment they receive which lead to ‘contamination’ whereby a patient receives a treatment even if they are in a control group (Cuzick et al, 1997). Clinicians delivering an intervention may not be representative of the wider population (e.g. enthusiasts for an intervention) and experimental treatment tends to be of higher quality than treatment delivered in other settings (e.g. involving more senior clinicians with more resources).

In a criminal justice setting, Prendergast (2011) highlights these main limitations of undertaking randomised designs echoing Black (1996) and McKee (1999). These include ethical and practical issues of implementing a trial in a prison environment. Polaschek (2019) expands this argument by suggesting that if an offender is allocated to a little-known treatment which turns out to be ineffective, leading to criminal activity on release, this will have unforeseen consequences for community safety. As stated, interventions may be tested by motivated staff with significant resources, and therefore do not reflect real-world situations. Third, treatments are often more sophisticated than a single intervention comprising different components which may require “*dismantling*” into their component parts (Prendergast, 2011: 6). Finally, Prendergast suggests that the evidence-base for interventions may be too blunt, in that there is an assumption that a successful treatment outcome will work for all types of offender regardless of need. This emphasizes the need to determine a treatment effect across different treatment components rather than for a single treatment system.

Polaschek (2019) develops Prendergast’s (2011) critique of the problems of randomisation to include problems associated with attrition and in particular issues with ITT where individuals are categorised as receiving treatment, but in reality, do not, thereby creating assumptions and

biases within causal models. Even with sophisticated randomisation approaches, there is no guarantee that matched individuals will be correctly allocated to treatment or control groups due to a range of unobserved contextual factors. The lack of blinding also causes problems with raising participants' expectations about accessing treatment, which have been shown to affect therapeutic outcomes (Polashek, 2019). Polashek (2019) further argues that an inherent publication bias towards publishing positive treatment effects may lead to overstating outcomes.

The collapse in methodological integrity can be demonstrated in a randomised trial of alcohol brief interventions within police custody (Addison et al., 2018) that illustrates the effect of these practical issues and how these can create unforeseen biases. Firstly, allocation to a treatment and no-treatment group was not blinded. Second, selection criteria were invoked that restricted eligibility (e.g. sufficiently literate in English, having a fixed home address, not being under the influence of substances or in withdrawal) creating selection bias by removing one-third of the cohort. The study then suffered from high attrition rates reducing the number available for re-interview at follow-up and a lack of 'balance' between the control and treatment groups (women, being white, married were more likely to receive treatment whilst the control were more likely to be employed and living in deprived areas). The high levels of attrition rates at follow-up have been shown amongst other AUD populations within the criminal justice system (e.g. Blakeborough and Richardson, 2012). This prevented the study from being able to provide any salient comment on the efficacy of the treatment provided.

Although there may be mileage in experimentation for single interventions affecting sub-populations, services that offer universal coverage may be complex and expensive to undertake in criminal justice settings, where the risk of creating selection biases may be too

strong (Polashek, 2019; Hollin, 2008b; Farrington, 1983). Quasi-experimental methods that compare a treatment (or intervention) group with a non-treatment group based on ‘similar’ characteristics have been developed relatively recently. Studies that have utilised waiting lists (Robinson, 1995) as a comparison group tend to suffer from small numbers (in the waiting list group) and from recognition that there may be an underlying reason for being placed on a waiting list (e.g. problem severity, lack of motivation). This may lead to differences in the characteristics between the two groups. Moreover, there is a danger of contamination of individuals held on the waiting list in that they may eventually access the intervention, thereby skewing the measurable effect of an intervention. The use of waiting lists is only viable if the individual in question does not receive the treatment or intervention at all.

To understand the nature of causality therefore, there is a need to create an appropriate and ‘balanced’ (e.g. comparable) comparison group. Nagin et al. (2009) provide an overview of the type of matching studies undertaken in criminal justice settings. One approach is to create an exact match (also known as covariate matching) that uses a small number of attributes and matches directly on these variables. For example, the covariates tend to be static factors based on available information derived from administrative datasets such as age, ethnicity, gender and sentence or offence details. However, this approach has been described as potentially suffering from “*tyranny of dimensionality*” (Nagin et al., 2009; p.145) where more covariates result in likely matches disappearing to zero, as the possibility of finding an exact match diminishes with each new covariate. Nagin et al. (2009) describes a minimum set of matched variables (reaching a maximum of seven) that should include age; gender; ethnicity; prior convictions; current offence type. Exact matching has been shown to be problematic in ‘real-world’ criminal justice settings with studies unable to replicate findings on similar interventions such as use of prison-based accredited programmes (Friendship et al., 2005).

There has been some discussion in the literature as to the optimal composition of a comparison group. Comparisons between samples can be made across two types of factors – static and dynamic. Static factors include demographic and criminal history and are fixed and immutable, such as age, gender, ethnicity and offence or sentence details (Bonta et al., 1998). “*Clinical or social variables*” (Friendship et al., 2003; p118) have increasingly been considered as essential to explain differential rates of reconviction and are defined as ‘dynamic’ factors as they may be subject to change over time. For example, housing or employment status, treatment or intervention received, are all examples of such factors. Static factors have historically been shown to have greater efficacy in predicting changes in reconviction rates (Taylor, 1999; Colledge et al., 1999) although this may be due to the scope of data that are available, and the suitability of the available dynamic factors as potential prognostics (Friendship et al., 2003).

7.4 Concluding Thoughts

The chapter has suggested that there are fundamental questions of bias that affect cohort studies and randomised trials aimed at establishing an effect for substance misuse treatment. It has been shown that biases including ITT issues affect community and prison-based (namely TCs) cohort studies, and caution is advised in assuming a clear and incontrovertible treatment effect is present in all these studies. The chapter introduces alternative methods to address these methodological deficiencies, which are discussed further in the next chapter.

Chapter 8: Review of Quasi-Experimental Methods for use in Criminal Justice Treatment Settings

8.1 Introduction

This chapter presents quasi-experimental alternatives to the cohort and randomised design issues that were discussed in Chapter Seven. Two main approaches to quasi-experimental methods for observational studies will be discussed. The first focuses on a method for binary treatment using propensity score matching (PSM). The second for when multiple treatment options exist. Although this will be presented as an alternative option, it includes four regression-based estimation methods, regression adjustment (RA), inverse probability weighting (IPW), augmented inverse probability weighting (AIPW) and inverse probability weighted regression adjustment (IPWRA). These four methods have been grouped as they broadly share the same underlying principles.

8.2 Propensity Score Matching: Provisional Causality for Binary Treatment

Use of experimentation techniques can test “*links in the chain*” (Shadish et al., 2002: 11) where an event (e.g. a treatment) causes an outcome. It can also test the veracity of competing theories, the strength and direction of an outcome, and describe the links that comprise the chain. Therefore, experimentation illuminates causal inference, so that one can argue that treatment leads to changes in offending behaviour. Yet, Holland (1986) argues that there is a ‘fundamental’ problem of causality, such that it is rarely possible to determine whether reoffending has occurred in the absence of treatment. The statistical solution to this

problem of causality is to determine the average treatment effect (ATE) as the difference between the average outcome when the treatment is present compared to when it is not.

To replicate the key elements of randomisation, sophisticated statistical techniques have been developed. Shadish et al. (2002) place ‘quasi-experimental’ approaches within observational studies as they argue the latter term alone is too wide to differentiate between other correlational or non-experimental designs. Data used in quasi-experimental methods may be derived from multiple sources including surveys or administrative records (Winship and Morgan, 1999). Assignment to treatment can either be achieved through self-selection (where an individual seeks treatment) or through ‘administrator selection’ where a third-party (such as a magistrate, healthcare provider or similar persons) decides who should receive an intervention (Shadish et al., 2002). Quasi-experimental counterfactuals have been developed across econometric and statistical perspectives with input from health and behavioural sciences (Guo and Fraser, 2014). In the realm of substance misuse, propensity score matching has begun to evolve in the UK and has been used in probation settings for alcohol-only offenders (McSweeney, 2015); assessing the impact of drug diversion programmes (McSweeney et al., 2018) and examining probationers in drug treatment programmes (Pierce et al., 2018).

Furthermore, studies need to address ‘internal validity’ whereby an explanation for an outcome may be due to an external factor that has not been considered. Shadish et al., (2002) have identified ‘ambiguous temporal precedence’, ‘selection’, ‘history’, ‘maturation’, ‘regression’, ‘attrition’, ‘testing’, ‘instrumentation’ and ‘addictive or interactive’ threats to internal validity (Shadish et al., 2002: 54-55). Yet quasi-experimentation may also underestimate the treatment effect by misunderstanding the selection process into treatment

where, for example, self-selection may predict more problematic needs (Sweeten, 2017; Guo and Fraser, 2014; Shadish et al., 2002). Guo and Fraser (2014: 23) refine the list of threats to internal validity through ‘self-selection’, ‘bureaucratic’, ‘geographic’, ‘attrition’, ‘instrument’ or ‘measurement’ selection. By aiming to address these threats, Shadish et al. conclude that, *“randomised designs are usually superior to non-randomised designs”* (Shadish et al., 2002: 502).

The development of propensity score matching is a relatively recent innovation that aims to minimise selection bias. A ‘propensity score’ is derived from a logistic regression model where the dependent variable will be people in prison receiving alcohol treatment and the regressors will include variables that describe the characteristics of this population (Rosenbaum and Rubin, 1983; 1985). Matches are selected through ‘close-proximity’ to the scores of the treated population. With many potential confounders, it may be difficult to select a match that corresponds to a treatment participant. PSM creates a propensity score which gives each person a unique measure that summarises the relationship between the covariates and the treatment assignment, and in doing so, removes any biases associated with the covariates (Rosenbaum and Rubin, 1983). It therefore assumes that a person with the same or similar propensity scores will have a positive probability of being in the treatment or counterfactual group. The propensity score is also a ‘balancing’ score in that, after matching, the empirical distribution of covariates should be similar for the treatment and counterfactual group given the covariates included in the model. The successful estimation of the propensity score will therefore be dependent on the extent to which there is ‘balance’ between treatment and counterfactual groups (Rosenbaum and Rubin, 1983). Therefore, the mean difference in outcomes between the treatment and counterfactual group (at a given propensity score) will be the ATE at that propensity score.

Rosenbaum and Rubin (1983) describe the steps to estimate the effect of treatment using quasi-experimental methods. First, the process requires a calculation of the propensity score for each subject in the dataset. Secondly, the created propensity score is then matched to a non-treated individual from the counterfactual group; and thirdly the creation of two separate groups allows for the estimation of the average treatment effect in comparison with the matched group. The choice of covariate for inclusion for selecting the counterfactual group should be related to the selection process into treatment, as this would also affect bias. Equally, Rubin and Thomas (1996) caution against ‘trimming’ models unless there is consensus that the covariate has no theoretical basis in explaining treatment outcomes. The three steps to estimating treatment effect are discussed more fully below.

8.2.1 Step 1: Matching Variables

There are techniques that can be deployed to create the matched control group including stratified matching; nearest neighbour matching; radius and kernel matching, each deploying a variation on the use of the propensity score. Dehejia and Wahba (2002) argue that when there is considerable overlap in the propensity scores distribution across treatment and control groups, all matching methods will yield similar outcomes. The easiest matching technique to conceptualise is ‘nearest neighbour matching’ whereby a participant from the treatment group is matched to an individual with the closest propensity score in the counterfactual group. This approach can be refined using ‘with replacement’ (case can be used more than once) or ‘without replacement’ (case can be used only once). The choice of matching estimator is dependent on the structure of available data (Zhao, 2000). For example, if there are only a few individuals within the counterfactual group, then it makes sense to deploy a ‘with replacement’ matching strategy to maximise the cases available. Equally with a large

counterfactual group, it may be appropriate using more than one nearest neighbour to maximise comparable individuals. The actual choice of variables to utilise has been subject to some debate. Austin (2014) argued against using with-replacement for PSM models due to greater variability in estimates. Therefore, based on recommendations by Austin (2014), this thesis will deploy a nearest neighbour caliper matching without replacement when matching treated to untreated subjects to establish a counterfactual group.

The method matches a treated subject to an untreated case with the closest propensity score based upon the distance (the ‘caliper’ which is described below). If more than one untreated subject is close to the propensity score of the treated case, then one of the untreated subjects is randomly selected as the ‘match’ which is automatically undertaken by the *psmatch2* (Leuven & Sianesi, 2003). The matching algorithm has been defined as ‘greedy’ as the nearest untreated subject is always selected even if that case was closer in score to another person in the treated sample (Austin, 2008). A logistic regression model is deployed to calculate each subject’s propensity score using the covariates in Table 7. The ATE is estimated by matching each subject in the treatment group to a single subject not known to treatment with the closest propensity score. ‘Bad’ matches where the closest counterfactual is some distance away can be remedied by selecting a tolerance in the maximum propensity score distance (the ‘caliper’)¹⁷. Caliper matching defines the range in which a match is selected and is closest to the propensity score. It is the maximum permitted difference in the logit score between matched subjects. Measured in units of standard deviation of the logit score, a narrow caliper improves the performance of PSM by reducing bias but cannot be too tight or it will fail to match all treated units. The magnitude of this distance has been assessed

¹⁷ ‘Tolerance’ determines which subjects in the control group are to be matched to the treated group. It is rare that there will be an exact match, so the tolerance establishes the boundary by which a match occurs. Whilst a lower value in tolerance will reduce the number of available matches, it will provide a more precise match.

in the wider literature, which suggests a caliper of width equal to 0.2 of the standard deviation (SD) of the logit of the propensity score (Rosenbaum and Rubin, 1983). For the purposes of this study a caliper of 0.2 has been utilised although the Ministry of Justice have used a caliper of 0.1 for some smaller and more localised studies (Ministry of Justice, 2018, personal communication). For the purposes of this study, justification of the 0.2 caliper was considered ‘satisfactory’ to ensure sufficient robustness (Ministry of Justice, 2016) and is seen as a level appropriate for most treatment settings (Austin, 2014; Austin 2010). Austin (2014) summarises caliper matching as ensuring higher quality matches through the elimination of differences between the treated and the counterfactual group, but biases can occur when no match is made within the specified distance and the treated subject is therefore excluded from the analysis (often with a higher propensity score and therefore treatment need). The approach will include all subjects that fall within the set caliper distance (minimum one case), although it should be noted that Austin (2014; 2010) suggest that it is ‘rarely optimal’ to include more than two untreated subjects per treated subject (Austin, 2011; Rosenbaum and Rubin, 1983).

The choice of covariate for inclusion for selecting the counterfactual group should be related to the selection process into treatment (Sweeten, 2017). Heckman et al. (1997) have shown that the omission of key variables will increase the levels of bias creating unreliable average treatment effects. A covariate should also not have been affected by participation or anticipation of receiving treatment. Conversely, Bryson et al. (2002) show that inclusion of too many additional variables reduces the likelihood that a person could have equal probability of being in the treatment or counterfactual group, and that this would increase the variance in the estimates provided. Yet Rubin and Thomas (1996) caution against ‘trimming’ models unless there is consensus that the covariate has no theoretical basis in explaining

treatment outcomes. Austin's (2014:1245) review of PSM methods argues for inclusion of variables "*prognostic of outcome*" that should be theory-based rather than based on preliminary statistical testing. The importance of including variables that are related to outcomes and not just treatment selection has been emphasized elsewhere and shown not to affect estimation biases (Brookhart et al., 2006).

For this thesis, a range of static and dynamic variables have been included. OASys includes 128 questions that cover ten domains. An initial exploratory analysis (not presented) found large numbers of missing (around 40-50%) and skewed data for some variables (including accommodation, financial management and income, relationships attitudes). It was suggested that this was due to offender assessments not being completed/recorded onto OASys; issues with the assessment process and a lack of consistency with data input onto OASys (Ministry of Justice, 2019, personal communication). Imprisonment spell length has also been included as it has been shown to relate to the likelihood of engagement into prison-based treatment (Ramsay et al., 2005).

The failure to utilise all relevant data items is a major shortcoming of the methodology. Housing, finance and attitudes to relationships should be part of the core basis of any future modelling. In an attempt to examine the trade-off between quality of data and completeness, the following examines the outcomes using different datasets. Balancing diagnostics (see below for more detail) also found wide variances across some questions suggesting inclusion of these variables would be considered poor matches. As a result, it was possible to 'trim' poor quality matches into 78 dynamic questions. A 'trimmed' model of OASys data included variables encompassing emotional wellbeing, thinking and behaviour, attitudes, health, employment, financial management, relationships, lifestyle and substance misuse (illicit

drugs and alcohol separately). Consequently, this thesis will deploy a sensitivity analysis using three levels of Offender Assessment data from the entire OASys dataset (using 78 covariates); a ‘trimmed’ selection of data (41 covariates) minimising missing data (set at less than 20%) and a final analysis excluding all OASys data entirely.

Table 7: Logistic regression model matching on treatment for an AUD

	Coef.	SE	z	P>z	95% CI Lower	95% CI Upper
Emotional Wellbeing linked to Behaviour	0.12	0.05	2.42	0.02	0.02	0.22
Temper Control	-0.07	0.04	-1.97	0.05	-0.14	0.00
Problem Solving Skills	0.05	0.05	0.91	0.36	-0.05	0.14
Awareness of consequences	-0.12	0.04	-2.78	0.01	-0.21	-0.04
Physical Health	0.12	0.05	2.28	0.02	0.02	0.21
Employment linked to behaviour	-0.11	0.05	-2.10	0.04	-0.21	-0.01
Unemployment	0.03	0.02	1.11	0.27	-0.02	0.08
Encourage prosocial activities	0.02	0.04	0.40	0.69	-0.06	0.09
Illicit drug user	-0.64	0.06	-10.22	0.00	-0.76	-0.52
Alcohol use linked to behaviour	-0.64	0.08	-7.70	0.00	-0.81	-0.48
Binge Drinker	0.42	0.03	13.00	0.00	0.35	0.48
Age	0.02	0.00	7.46	0.00	0.02	0.03
Age at first offence	0.00	0.00	0.65	0.52	-0.01	0.01
OGRS Risk Assessment	-0.03	0.01	-2.91	0.00	-0.05	-0.01
Previous court orders	0.00	0.01	-0.07	0.94	-0.02	0.02
Previous breach	0.00	0.01	0.36	0.72	-0.01	0.02
Criminal Damage	0.01	0.01	1.31	0.19	0.00	0.02
Domestic Burglary	0.04	0.03	1.34	0.18	-0.02	0.09

Drink Driving	0.04	0.02	2.28	0.02	0.01	0.08
Drugs Import Export	-0.04	0.04	-1.14	0.25	-0.12	0.03
Drug possession supply	-0.10	0.01	-7.11	0.00	-0.12	-0.07
Fraud Forgery	0.00	0.01	-0.11	0.91	-0.02	0.02
Handling	-0.06	0.02	-3.02	0.00	-0.10	-0.02
Other Burglary	0.01	0.01	0.63	0.53	-0.01	0.02
Public Order	0.01	0.01	2.07	0.04	0.00	0.02
Robbery	-0.03	0.04	-0.81	0.42	-0.11	0.05
Sexual Offences	0.06	0.03	2.01	0.04	0.00	0.12
Theft	0.00	0.00	-0.49	0.63	-0.01	0.01
Theft of vehicles	0.03	0.03	1.00	0.32	-0.03	0.09
Violence against the Person	0.01	0.01	2.77	0.01	0.00	0.02
Previous Offence	0.09	1.07	0.09	0.93	-2.00	2.19
High severity offence (previous)	-0.14	1.07	-0.13	0.90	-2.23	1.96
Medium severity offence (previous)	-0.14	1.07	-0.13	0.90	-2.24	1.96
Low severity offence (previous)	-0.09	1.07	-0.09	0.93	-2.19	2.00
Previous prison events	0.00	0.01	-0.62	0.54	-0.02	0.01
Previous conviction events	0.00	0.01	0.17	0.87	-0.01	0.01
High severity offence (current)	-0.19	1.07	-0.17	0.86	-2.28	1.91
Medium severity offence (current)	-0.53	1.07	-0.50	0.62	-2.63	1.56
Low severity offence (current)	-0.38	1.07	-0.35	0.72	-2.47	1.71
Last Offence Type	0.00	0.00	-0.67	0.50	0.00	0.00
Prison Spell Length	-0.25	0.08	-2.93	0.00	-0.41	-0.08
Gender	0.12	0.05	2.42	0.02	0.02	0.22

The logistic regression model above calculated each person's likelihood of receiving treatment and the subsequent propensity score ranging from '0' (certain of not being treated) to 1 (certain of treatment). This shows that the treated group are different in characteristics

compared to those untreated. Significant difference across the treated group included people in prison more likely to be defined as ‘binge drinkers’ (42% greater odds) and have a physical health problem (12% greater odds). Conversely, the control group presented with 64% greater odds for both use of illicit drugs and if their alcohol use was linked to their criminal behaviour. The control group also had 25% greater odds of a longer prison spell.

It should be noted that there are critics of PSM at this stage of the matching process. King and Nielsen (2016) have argued that PSM is problematic in that PSM “*often accomplishes the opposite of its intended goal – increasing imbalance, inefficiency, model dependence, and bias.*” (King and Nielsen, 2016: 1). The authors critique Rosenbaum and Robin's analysis of the propensity score properties, which they claim, whilst being mathematically correct, cannot be seen to be relevant to ‘real world’ data. They argue that use of a propensity score facilitates a lowering of standards by approximating only complete randomization with only average levels of imbalance, rather than a fully blocked experiment with greater levels of balance between control and treated groups. However, proponents of PSM have argued that when key covariates are controlled for, a matching process using a propensity score provides equally optimal estimates as in randomised trials. However, it can be argued that the efficiency and unbiasedness of PSM depends on controlling for any variables that are prognostic of outcomes. These factors are true for any process that matches a control to a treated group (randomised or quasi-experimental).

8.2.2 Step 2: Assessing the Match quality (Covariate Balance)

Designed studies in which treatments are allocated according to a randomisation schedule are considered to yield unbiased treatment effect estimates, as treated and untreated groups are considered equivalent across subjects’ characteristics (Bowes et al., 2014). However, in

observational studies treatment selection is often influenced by subject characteristics, resulting in systematic differences in baseline characteristics between subjects in the treated and untreated groups (Sweeten, 2017; Shadish et al., 2002). The lack of random treatment allocation has been shown to yield biased treatment effect estimates (Austin, 2007). A key requirement of analytical techniques for estimating treatment effect in observational studies is therefore to try to re-balance the subjects' characteristics between groups being compared, termed 'covariate balance'. The matching procedure must be checked to determine whether the distribution of covariates is 'balanced' in the treated and counterfactual group. If balance of covariates is not achieved, then matching was not successful which should be checked and modified. Balance is measured through standardised differences (close to 0) and variance differences (close to 1). Other than a p-value of less than 0.05 to denote statistical significance, there is little documentation as to a formal definition of 'balance'. Austin and Mamdani (2006) have suggested that a standardised difference of 0.1 (10%) is suggestive of balance between treated and untreated groups.

Austin (2014) recommends graphical representation through density plots as a visual means to assess balance (Figures 1-2 below). In one of the few studies to specifically use PSM to evaluate reconviction in a UK context, McSweeney (2015) used four covariates: age, main offence, employment status, and the Offender Group Reconviction Scale (OGRS) which is a predictor of re-offending based on age, gender and criminal history. A similar reconviction analysis of alcohol treatment programmes for male offenders also created a comparison group by age, OGRS score and type of offence (Needham et al., 2015). By way of comparison, this study presents matching using a number of static and dynamic indicators.

Figure 1: Balance diagnostic: absolute mean standardised difference

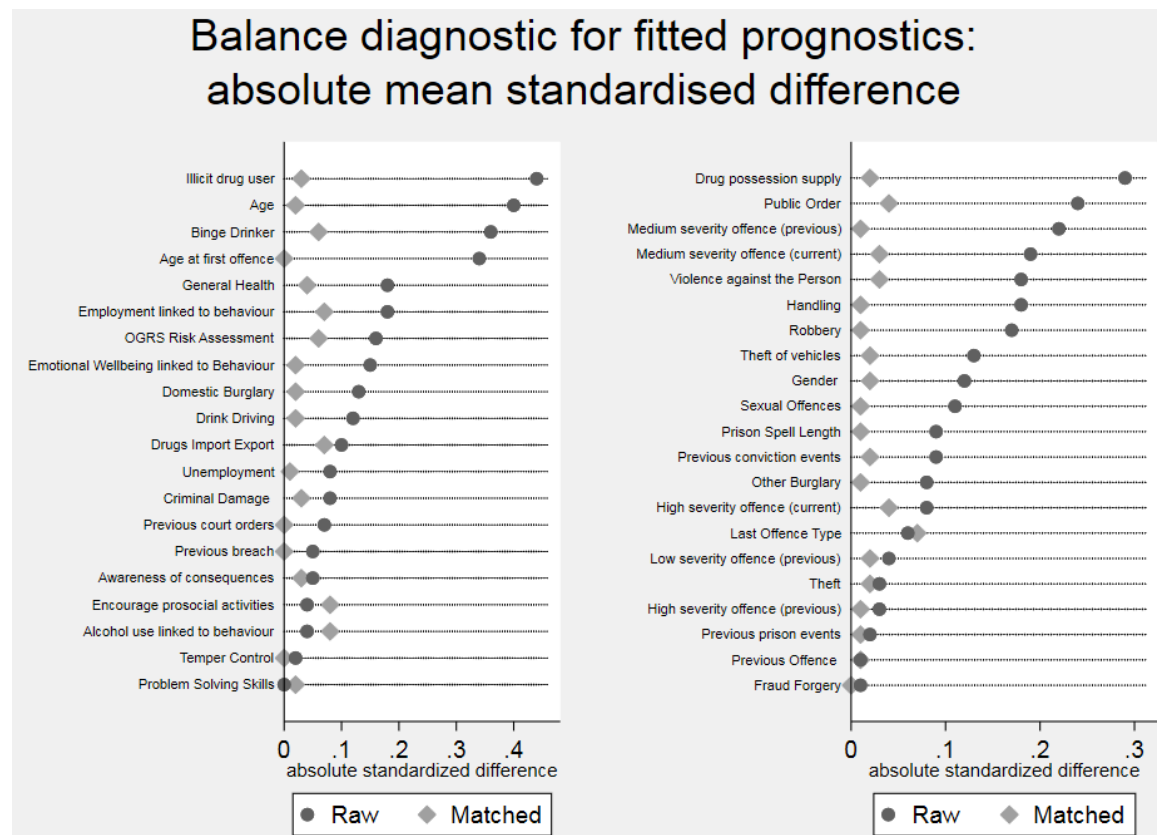
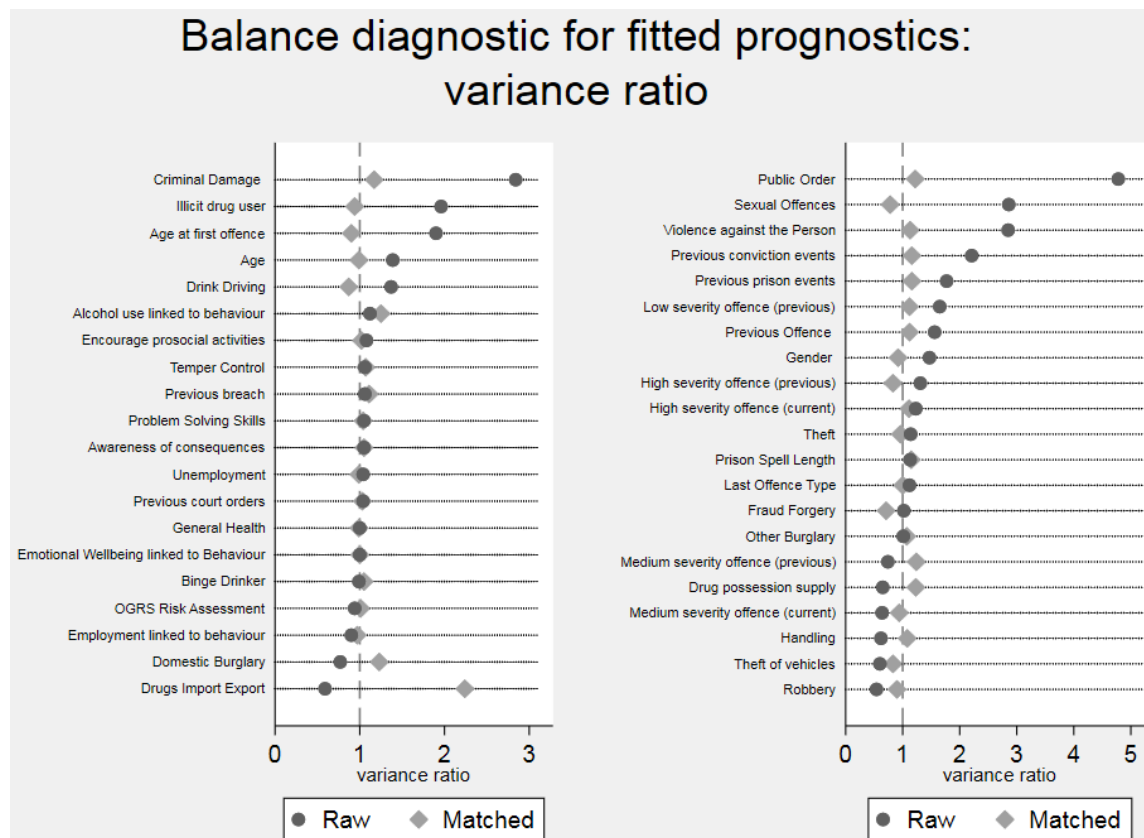


Figure 2: Balance diagnostic: Variance Ratio



Most of the included variables were shown to fall within Austin and Mamdani's (2006) recommendation. Figures 1-2 examining the variance ratios suggest fourteen variables that were beyond the 0.1 cut off¹⁸. A sensitivity test on the reconviction outcomes was undertaken on (a) the entire dataset; (b) removing all covariates that do not fall within this threshold and (c) only removing the outlier of 'drugs: import export' which after weighting is seen to be less balanced than the raw figure. The outcomes using all three of the above tests did not affect the outcome (they all produced the same reconviction rate). Consequently, all variables considered less balanced compared to the raw data were subsequently removed from the final analysis as recommended in the literature.

8.2.3 Step 3: Estimating the impact of treatment

The final analytical step is to derive an estimate of the effect of treatment on the outcome (reoffending). Rosenbaum and Rubin (1983) argue that conditional on the propensity score, baseline covariates are independent as to whether a person receives treatment or not. Put another way, treated and untreated subjects with close propensity scores will not differ from one another in terms of characteristics. For this study, STATA *teffects psmatch* command was used which implements the ATE estimator and standard errors described by Abadie and Imbens (2016; 2006).

¹⁸ Criminal damage, alcohol use linked to behaviour, domestic burglary, drugs import and export, public order, violence against the person, previous prison events, previous convictions, low severity offences, medium severity offences, high severity offences, previous offence (other), any drug possession supply, handling stolen goods.

8.3. Estimating Provisional Causality for Multiple Treatments

A criticism of approaches that use prospective cohort designs or PSM on binary treatment is that it does not reflect real world treatment situations where individuals may have access to different treatment components. Moreover, as described in the previous chapter, people in prison receive fragmented access to treatment often on a rolling basis as opposed to a defined treatment programme, such as those offered by OBPs. Rather than assessing a single intervention or treatment it may be possible to derive within-group controls for different treatments. For randomised trials, outcomes for multicomponent treatments may be analysed by regressing the outcome against variables relative to each treatment component, then contrasting across the treatment variables to derive separate treatment effects. However, with observational data there is a need to apply causal-inferential models to weight for confounders.

There has been a methodological shift in applying the principles of PSM to multicomponent treatment using observational data. The methodology developed by Abadie and Imbens (2006) for measuring binary treatment is not appropriate for multicomponent treatments (Stata Corp, 2013). Methodologies encompassing regression and inverse probability weighting have been created to evaluate multiple treatment components in medicine (Linden et al., 2016). In this thesis, provisional causal treatment effects will be assessed using four alternative methods: regression adjustment (RA), inverse probability weighting (IPW), augmented inverse probability weighting (AIPW) and inverse probability weighted regression adjustment (IPWRA). All four methods yield two sets of estimated quantities: a set of model-based predicted means for each treatment group (known as Potential Outcome Means), which are then compared to find a set of pairwise differences between treatment

group means (or Average Treatment Effect). As the outcome measure is binary, predicted treatment means can be interpreted as predicted probabilities of reoffending in each group and their pairwise differences can be interpreted as risk differences.

The RA method first models the reoffending outcome (on a set of prognostics), separately for each treatment, then predicts the probability of reoffending for all subjects in the database, all assigned to each treatment in turn, and averages individual predictions by treatment group.

The RA method does not model the treatment assignment. The IPW method first models the treatment assignment (on a set of prognostics), then predicts the probability of treatment assignment for each subject in the database and computes the inverse of these probabilities (termed Inverse Probability Weights, or IPW). The latter are then used when predicting the reoffending outcome for each subject in the database, according to their assigned treatment only, and averages individual predictions by treatment group. The IPW method does not model the reoffending outcome.

The remaining two methods also first model treatment assignment for deriving inverse probability weights as described above, though these weights are used at different stages. The AIPW method models the reoffending outcome, separately for each treatment, then predicts the probability of reoffending for all subject in the database, all assigned to each treatment in turn, then adjusts such predictions using inverse proportional weights as a correction factor, and finally averages individual predictions by treatment group. The IPWRA method differs only in that it uses inverse probability weights when modelling the reoffending outcome, and not as a correction factor of the model-based predictions. So both the AIPW and IPWRA methods are said to be ‘doubly-robust’ because they explicitly model both the treatment assignment and the reoffending outcome; their estimates will be consistent even when either

the treatment model or the outcome model (but not both) are mis-specified. Doubly robust methods are considered the most efficient at estimating treatment effects for multiple treatment in observational studies (Linden et al., 2016).

8.3.1 Covariate Balance

As regression adjustment does not use weights to derive an estimate and the other estimates use the same weights, only one covariate summary is required for balancing. The extent to which this requirement for the weighting method achieves covariate balance was assessed visually using the approach recommended by Austin and Stuart (2015). Their suggestion is to illustrate absolute mean standardised differences between covariates in each treatment group relative to the untreated group, using ‘raw’ and ‘weighted’ data. It should be noted that there are fewer covariates (18) compared to the ‘trimmed’ PSM (41) and complete (128) models, as the models could not sustain a large number of variables (see below for more on this issue). Ideally, all symbols of the weighted absolute mean standardised differences would be aligned above the value of zero on the horizontal axis. The next best practical scenario is shown in Figure 3 for the pharmacological-only treatment group, where all symbols for the weighted differences are on the left of those for the raw differences, suggesting that covariates are more balanced after weighting than before it. For the RNR-compliant group (Figure 4), four covariates (employment linked to offending, previous breaches, previous court orders and age at first offence) were less balanced after weighting than before it, due to the small samples size of this group. Figure 5 shows only one prognostic (uses Illicit Drugs) less balanced after weighting than before it for the PSI non-RNR compliant groups. As with PSM, sensitivity tests were run keeping and removing the balanced variables, which showed no differences in outcomes.

Figure 3: Covariate Balance for Pharmacological-only Treatment compared to untreated control group

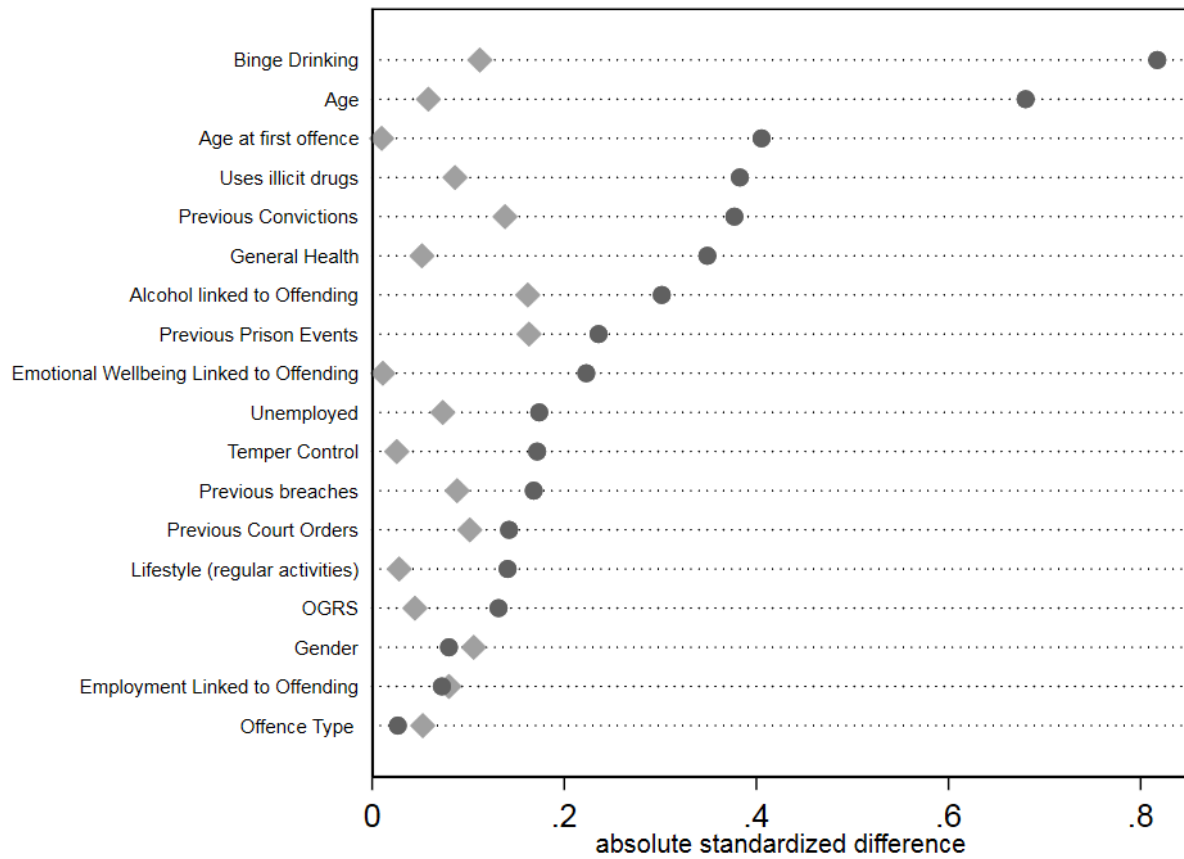


Figure 4: Covariate Balance for RNR Compliant Treatment

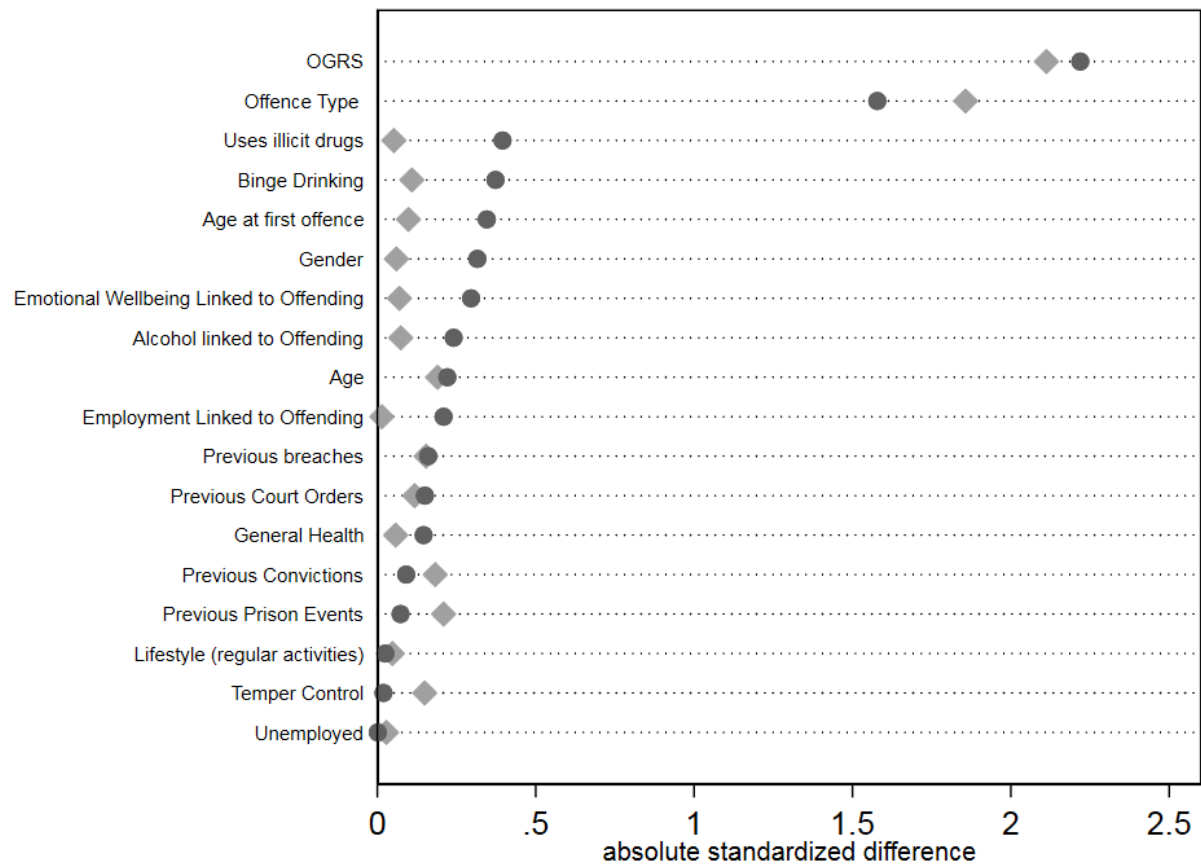
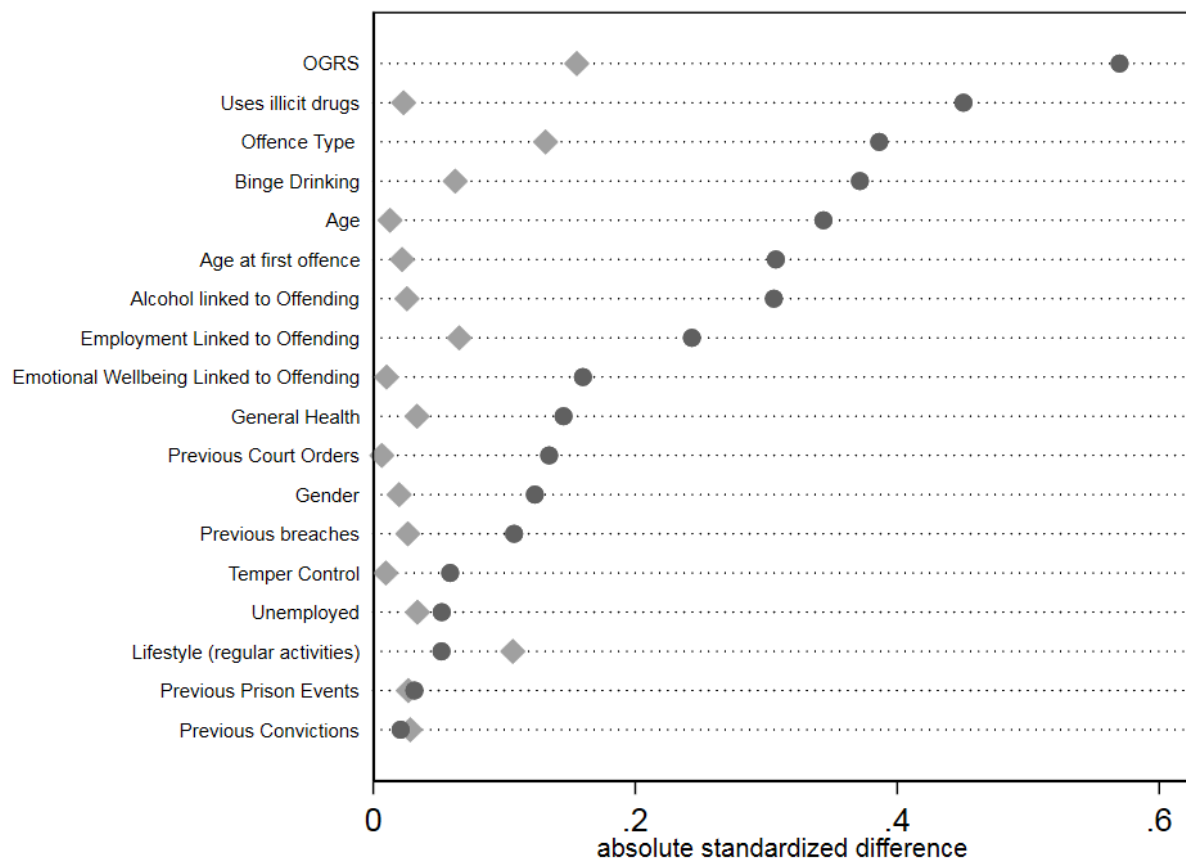


Figure 5: Covariate Balance for PSI Non-Compliant Treatment



8.4. Concluding Thoughts

This chapter presents the method underpinning the estimation of a treatment effect for binary and multiple treatments. The approaches described in this chapter places an emphasis on transparency when ensuring balance between treatment and control groups. This can be shown to be important as the logistic regression model highlighted the differences between the treated group (more likely to be binge drinkers and have health problems) and the control group (more likely to use illicit drugs and have a longer stay in prison). Consequently, it is likely that previous quasi-experimental techniques may be inadequately balanced as this

information is either not presented or excludes key covariates such as drinking or drug use patterns, physical health needs and length of stay in prison. The next chapter describes in detail the methods for estimating a provisional causal treatment effect for both binary and multiple treatments.

Chapter 9: Methods: Study design, Measures and Procedures

9.1 Introduction

This thesis will examine the reconviction rate of people in prison treated for an AUD compared to a derived control group using two separate but complementary techniques. The first scenario will use PSM to establish provisional causality across a treatment system examining reconviction rates for the ‘treated’ versus ‘untreated’ groups. The second aim will be to understand variances in reconviction rates by different treatment types:

Pharmacological-only, PSI that are RNR compliant, and ‘other’ forms of PSI.

The measure for reoffending¹⁹ was a binary (yes/no) for any reconvictions within one year from the date of release from prison during 2013-14. Offending excludes Penalty Notices for Disorder but includes convictions and cautions. The time to re-offend was modelled as part of the PSM approach using time-to-event models (e.g. by dichotomising it if a person in prison has reoffended within a year). This was achieved by using *psmatch2* to achieve a one-to-one match without replacement followed by a Cox model with the treatment group only.

The main hypothesis across all methods to be tested for this thesis is whether the ‘treated’ cohort is reconvicted at a lower rate than the derived control group(s). Where there have been multiple treatment episodes within a year through transfer within the prison system (from prison to another prison), the nearest treatment episode to the point of release is defined as the ‘index treatment’ from which offending is measured (that is, the date of leaving prison for that episode of treatment).

¹⁹ ‘indicator_1y_reoff_excPNDs’

To supplement the estimation of a treatment effect, a time-to-event analysis was deployed. Here the dependent variables are the time to reconviction and whether the event happened at all (whether a person was reconvicted or not). Two components are, therefore, the survival and hazard functions. The survival component provides the probability of ‘surviving’ (or not experiencing an event) up to that time. The hazard component states the probability for that event to occur given that an individual has survived up to the specified time. The models that are developed will need to include a range of covariates to help explain differences in reconviction rates. The approach chosen for this study is a semiparametric approach, the Cox proportional hazards model, the most popular in epidemiology, which allows the baseline hazard to remain unspecified. The time-to-event method enforced one-to-one matching using matched pairs as advocated in Austin (2014). The hypothesis to be tested was whether the treated group (exposure to alcohol treatment) were reconvicted at a lower rate to the comparison group. The method deployed a marginal Cox model with only treatment as a prognostic and the inverse proportional weights (derived from a one-to-one matching without replacement) as covariates as recommended by Austin (2010a). Use of a standard Cox model without running a prior PSM stage to obtain matching pairs is reduced to a conditional Cox model, which whilst appropriate for an RCT, is not for an observational study. Rather this study deploys a marginal Cox model with matching pairs. It is marginal in the sense that the hazard is modelled as being related to treatment alone (the definition of a marginal model) which follows the methodology recommended by Austin (2013).

9.2 Study Design

The study can be categorised as an ‘observational’ study (Cochran, 1965) attempting to understand the relationship between an intervention or treatment (treatment for an AUD) and

a desired outcome (in this case patterns of offending). Cause and effect models establish a counterfactual – in that one can determine what happens after a treatment event. Creation of the counterfactual answers the question of what would have happened to those same people if they did not receive treatment. This study deployed multiple quasi-experimental techniques to observational data on all people in prison (aged 18 or more years) who accessed structured treatment for an AUD and who were released from prison during 2013-14.

9.2.1 Accessing the Datasets

This thesis required access to datasets across public health (held by PHE) and offending (Ministry of Justice). The datasets were the National Drug Treatment Monitoring System (NDTMS), which is a national public health surveillance system that collates activity data on individuals in prison and in the community from specialist drug and alcohol services (Public Health England, 2019a). NDTMS collected information on individual needs, a description of the treatment received, and summary information on the outcomes of their treatment.

Offending data comprised four files. The first was a file of prison leavers for the year 2013-14 which including a unique identifiable key ('NOMISID') that could be linked across all datasets. A separate interventions list provided information on any OBPs provided in prison that could be linked to an individual person using the unique ID. Police National Computer (PNC) collects details on offending including offence committed and conviction dates which allow for the calculation of offending rates post-release (Home Office, 2014). This is determined as any reconviction offence (see below) one-year from the point of release from prison. The fourth and final file was the Offender Assessment System (OASys) that provides a risk assessment of people in prison using static and dynamic risk factors (Moore, 2015).

Access to these datasets was agreed through a Service Level Agreement between myself, PHE and the Ministry of Justice (Appendix III). PHE acted as a repository for all the datasets prior to linkage. Accessing the information proved problematic as OASys data was initially withheld due to concerns over data quality and coverage. I also had to become a temporary PHE employee to allow access to any data. These procedural issues created blockages in accessing the data. This was compounded by two general elections in 2017 and 2019, which resulted in ‘purdah’ which was a period where non-essential governmental activity was not permitted by government, thereby creating another delay in accessing the datasets. It should be noted that access to data was dependent on having a cross-government contract with the Ministry of Justice and PHE. It is unlikely that, without such a contract, a similar study could be undertaken by an external (e.g. non-governmental) researcher. This has implications for the replicability of such analyses in the future.

9.2.2 *Reoffending Measures*

Use of reconviction rates has been accepted as one of the main methods to measure reoffending post-intervention based on data derived from the Police National Computer (PNC). Reconviction is defined as “*an appearance in court where there has been at least one finding of guilt, irrespective of how many offences were dealt with on a single appearance*” (Lloyd et al., 1994: p5). The Ministry of Justice (2016: 4) has further refined reoffending as:

“*...any offence committed in a one-year follow-up period that resulted in a court conviction, caution, reprimand or warning in the one-year follow-up or a further six month waiting period (to allow time for cases to progress through the courts).*”

Although use of reconviction rates has been considered a key measure of reoffending, this approach has been subject to criticism (Friendship et al., 2002; Lloyd et al., 1994).

Reconviction rates may not represent actual offending but rather are a proxy measure, a count of offences whereby an individual has been caught and prosecuted. Offences that have been committed but not detected by police will not be included and therefore may be an under-representation of the full extent of reoffending (Boorman and Hopkins, 2012; Kazemian, 2007). Commentators have suggested that the measure is too simplistic as it ignores changes in offending patterns including changes in offence severity (Friendship et al., 2001; Lloyd et al., 1994).

Also, reconviction rates may fluctuate in line with governmental policies and practices that may include or exclude offences depending on their legal status at any point in time (Lloyd et al., 1994). Definitions of reoffending also are fluid. A review of 90 US studies of recidivism highlighted nine categories including arrest, reconviction, incarceration, parole violation, parole suspension, parole revocation, reoffence, absconding, and probation violation (Maltz, 1984) with reconviction the most frequently used method (Tong and Farrington, 2006; Hanson and Bussiere, 1996). Studies have suggested that use of more than one outcome measure may be desirable as use of a simple incarceration or re-arrest/not incarcerated or arrested may “*mask*” the impact of treatment in other areas (Prendergast et al., 2003: 88).

Although there are concerns with the use of reconviction as a proxy measure for reoffending, commentators have suggested that use of some of the other approaches cited above may be too partial, too limited in its definition of offending and, more importantly, may not be linked to reoffending (Friendship et al., 2003; Lloyd et al., 1994). For example, police arrest figures may include individuals who may not subsequently be prosecuted for a crime and may be

affected by parole violations resulting from breaching terms of an offender's license conditions (such as failure to attend an appointment) rather than a result of actual illicit activity (Friendship et al., 2005). Similarly, imprisonment may be due to factors that include license breaches rather than committing and being prosecuted for a crime. Imprisonment may not always be the legal lever utilised – offenders may be punished through community sentences and this would not be flagged if imprisonment alone were used as an outcome measure. Therefore, whilst it can be shown that the reconviction measure only paints a partial picture of reoffending, it may be more comprehensive than other comparable measures such as re-arrest, imprisonment or violations of license conditions.

The use of the one-year time frame has also been questioned. For example, the issues with how long to measure reoffending, combined with defining a clear target population and varying choice of outcome measure can lead to estimate ranges of recidivism from 9-53% (Andersen and Skardhamar, 2015). Some studies have suggested that two years is a more reliable indicator to pick up the long-term effect of custodial interventions (Bowes et al., 2014; Friendship et al., 2001). However, Wooditch et al.'s (2014) study of reoffending among US probationers show that the main changes in reoffending occurred between 6-12 months suggesting that the one-year period may be appropriate. Figures from the Ministry of Justice (2020) suggested that between 2017-2018, the proportion of people in prison who reoffend in the first year following release from prison is between 29 and 32% down from 2004-2005 (47% reoffending). Therefore, a study that aims to capture changes in reoffending may be confident in measuring high volumes of offences to pick up differences between the treatment and comparison samples.

9.2.3 Ethical Approval

The study was approved by the Ministry of Justice and Public Health England's respective legal teams to ensure adherence to Data Protection Act, 1998 principles in addition to sign-off from PHE's Caldecott Guardian and the Office for Data Release. The study was also approved by the Middlesex University Health and Social Care Ethics Sub-Committee Application Number 1555 (Appendix IV).

9.3 Study Sample

The cohort to be studied were adult people in prison who were reported as having an AUD with use of alcohol as their only problematic substance – illicit drugs were not included in the analysis as this would act as a major confounder to the findings. Up to three problematic substances can be included on NDTMS and therefore records where alcohol is cited as the primary and the only substance were included. All treatment episodes were included from any person in prison known to have left an English prison during 2013-14 and who received either a pharmacological or psychosocial structured intervention. There were 115 active prisons reporting to NDTMS during 2014-15. All people in prison with an AUD who were triaged only and not accepted into a structured treatment programme were excluded from the study. These triage-only cases would include instances whereby a person in prison may have been triaged for initial acceptance onto a programme and who subsequently left the prison (released or transferred); those assessed as not suitable for treatment, and they may also have declined treatment prior to starting.

9.4 Procedures

All adult people in prison reported to prison-NDTMS during 2013-14 (Dataset A1) were matched to records held by treatment services in the community (Dataset A2) to derive a historical and prospective record of treatment engagement. The A1-A2 NDTMS utilised initials, date of birth and gender ('attributers') as the matching methodology. The file that was created based on the cohort of people in prison was defined as combined Dataset 'A' for this study.

9.4.1 *Creation of Dataset 'A' (Treatment Cohort)*

1. 95,357 records were extracted from the prison NDTMS ('A1')
2. Criteria were applied to the raw data (adult people in prison aged 18 or over and less than 100 years, treated in the adult estate only, alcohol-only records allowing tobacco as a subjunctive substance) filtered 18,122 records
3. People in prison in treatment who left prison during 2013-14 were selected creating 4,991 records
4. Data cleaning (English local authorities only; removed individuals with more than one combination of initials and DOB e.g. to check for double counting, removed combinations of initials and DOB with more than one client identifier (e.g. same prison number) – created a final treatment cohort of 4,803 episodes of treatment or 4,720 individual people in prison

Dataset 'A1' the treatment cohort consisted of 4,720 people in prison who had been released during 2013-14. This data was retrospectively and prospectively matched to community-

based treatment services (dataset ‘A2’) so that any person within dataset A1 can have a theoretical record for one year pre- and post- prison in 2013-14. A composite dataset (‘A’) was created that included treatment details for all people in prison released in 2014-15.

9.4.2 *Creation of Dataset ‘B’*

A dataset (‘B’) of administrative data on offenders was created using four separate datasets. The first file (‘B1’) list of prison leavers during 2013-14 was derived using an initial ‘Prison Spells’ datafile that included all records whereby an adult person may have left a prison. This ‘master list’ was matched using 15 matching criteria across the four other datasets.²⁰ The matching process sequentially runs through the 15 possible matches so that if match 1 yields no match, the program will move to on to Match 2 and so on. The match also utilises logical matching derived from the software system used (Matchcode which is part of the Dataflux system) that matches using phonetic (or ‘sounds like’) matching, the removal of double consonants (e.g. ‘Abbott’ with ‘Abott’ or ‘Abbott’ or ‘Abot’), vowels and non-alphanumeric characters with look-ups of alternative names (for example, Thomas, Tom, Tommy). The matching process is also subject to quality assurance processes including random checks on samples of data. Overall, the dataset created across multiple Ministry of Justice datasets can be viewed with some confidence. For people in prison with multiple episodes of incarceration, the last date of prison discharge was included as the ‘index’ (or primary) record.

²⁰ (1) Database ID+Database ID; (2) PNC ID + Initial + Date of Birth; (3) Database ID+Case Number; (4) PNC ID + Initial + Initial + Matchcode Surname; (5) Prison Number + Initial + Matchcode surname; (6) PNC ID + Matchcode surname+Date of Birth+Gender; (7) Criminal Records Office ID+ Matchcode surname+Date of Birth+Gender; (8) Prison Number+ Matchcode surname+Date of Birth+Gender; (9) Matchcode First name++ Matchcode surname+Date of Birth+Gender; (10) Firstname+Date of Birth+gender; (11) Matchcode Firstname+Date of Birth+Gender; (12) Matchcode Firstname+ Matchcode Surname+Year of Birth+Postcode+gender; (13) First Initial + Matchcode Surname+ Date of Birth+Gender+Postcode+ (14) Criminal records office ID+Postcode+Year of birth; (15) PNC ID+postcode+Year of birth.

The remaining offending files were linked together using the unique identifier including accredited OBP ‘prison interventions’ (‘B2’); PNC data to measure reoffending post release from custody including the Offender Group Reconviction Scale (OGRS) score (‘B3’) and the OASys risk assessment data (‘B4’). Matches across the datasets were linked using the nearest date to the point of leaving prison.

9.4.3 Creation of Dataset ‘C’

The derived datasets from adult treatment (Dataset A) were matched to the criminal justice datafiles held by the Ministry of Justice (Dataset B) using the unique identifier (NOMSID) to create a combined file (Dataset ‘C’). NDTMS holds the data in a relational format, and the structure was manipulated to create a flat file that allowed for matching to the composite Ministry of Justice Dataset B. The nature of the datasets created a degree of complexity. Ministry of Justice methodologies highlight the role of using the ‘index’ treatment (Ministry of Justice, 2018, personal communication), which is an intervention that is directly linked to an offender’s prison event. For people in prison with multiple prison events, it is likely that there will be several treatment episodes. Therefore, for the purpose of this study, the ‘index’ treatment episode was the NDTMS record that was the closest to the end of the prison spell and release back into the community.

Other issues with the use of multiple treatment episodes included quantifying a treatment length. This should notionally be a simple calculation of treatment end date less treatment start date to determine time in treatment. The relational structure of NDTMS allowed for multiple concurrent treatment interventions to be recorded within one prison stay. Adding all treatment interventions together would overstate treatment received, therefore the first

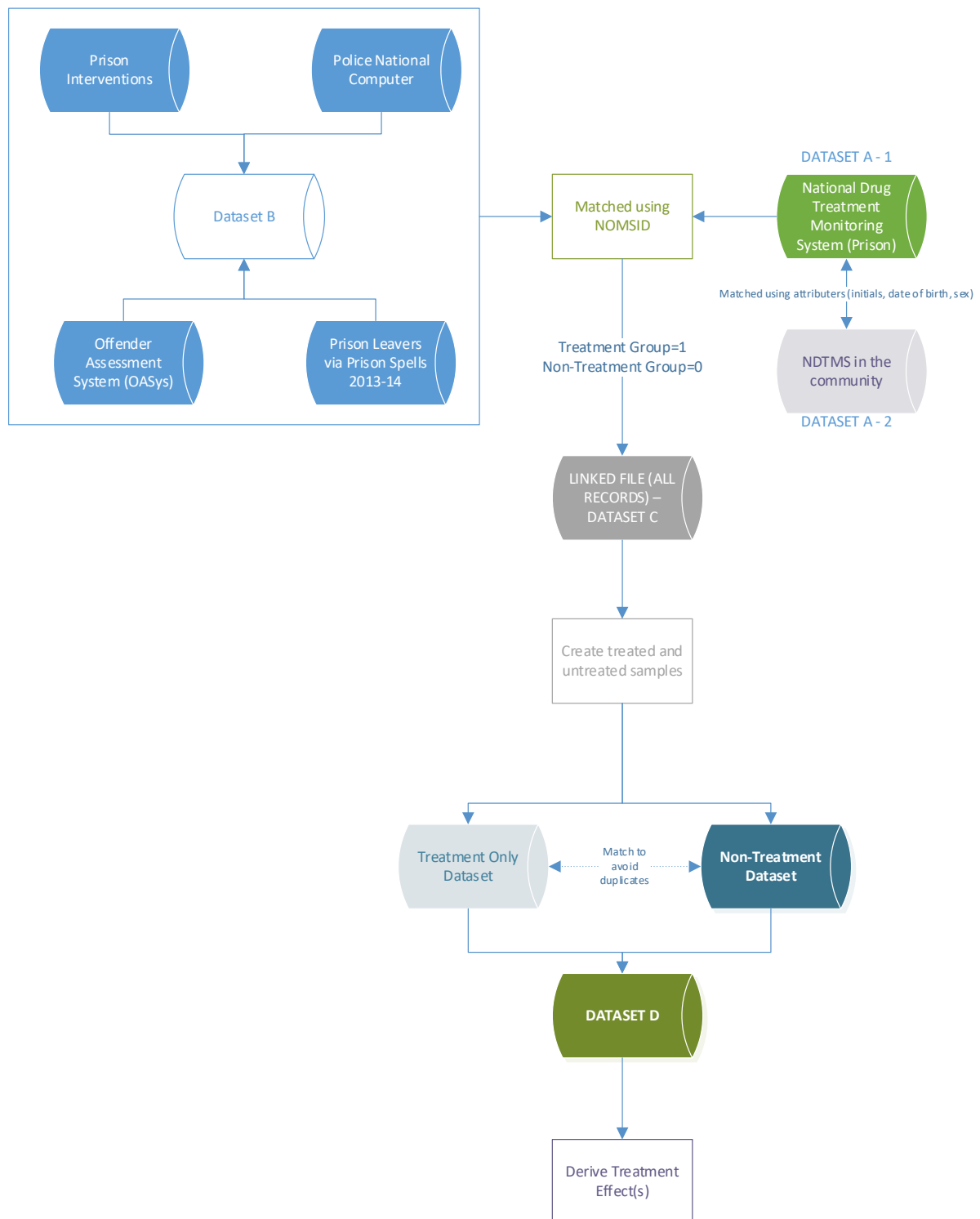
treatment intervention recorded was used as a ‘best fit’ (Public Health England, 2019, personal communication). NDTMS data were subsequently recoded to calculate treatment length (e.g. to create a ‘dosage’ estimation).

An initial analysis was undertaken of the characteristics of people in prison with an AUD known to treatment (Dataset A) to describe the population in terms of their offending/sentencing details, demographic/social needs, the level of engagement of OBPs, and the fields held within OASys. The results from the initial, exploratory analysis were used to inform the next phase of the research (the development of the propensity score match) creating a composite dataset (Dataset C) which was subject to data cleaning and recoding as appropriate. A final dataset of both the treated and untreated group was created (Dataset D). A summary of the approach is shown below in Figure 6.

9.4.4 Determining People in prison with an AUD

Using information contained within OASys, adult people in prison with an AUD were determined based on specific questions on: (a) whether the person in prison had been assessed as consuming alcohol which was linked to offending behaviour; (b) the severity of alcohol use prior to incarceration and (c) whether there was criminal behaviour associated with alcohol consumption (dichotomised into yes [1] or no [0]). Severity was determined using a specific question within OASys that asks about ‘significant’ use on an ordinal scale with the highest level assumed to correspond to ‘dependence’ (Ministry of Justice, 2017, personal communication). Out of 59,150 prison leavers, 26,654 people in prison (45%) were identified as having an AUD.

Figure 6: Model of the Matching Process



9.4.5 Dataset Matching

The matching process using the unique identifier yielded only a partial match with 2,647 matches (56%). A logistic regression model was run assessing whether certain segments were more likely to match. Males (Odds Ratio [OR] 1.42, p-value>0.0001), people in prison aged between 18-24 (OR 1.9, p-value=0.001) or 25-29 (OR1.6, p-value=0.013), and recorded as White (OR 1.5, p-value<0.0001) were all more likely to be captured in both datasets. In other words, females, being aged 30 or more and non-white people in prison were less likely to match across from the treatment dataset to the Ministry of Justice data.

9.4.6 Fuzzy Logic Matching

An enhanced data matching routine was created to augment the deterministic match using a unique 'NOMSID' identifier. Records were matched using two approaches. A 'deterministic' approach (Roos and Waida, 1991) matches individuals using the unique identifier. If a match is established, then a 'perfect match' is assumed and no additional matching will be undertaken. First, a match was included if it had the same recorded release date across the two datasets or within 7 days (Ministry of Justice, 2019, personal communication). Thereafter a probabilistic record linkage was run to test whether people in prison with 'similar' attributers (initials, date of birth) are likely to be the same person - the subject of miscoded data entry, aliases and people in prison providing inaccurate personal information (Table 8). A series of checks (e.g. matching rules) were created that assumed the likelihood of a match being correct (e.g. the same person) rather than being subject to random chance (e.g. two people sharing similar attributes). The technique assumes that each check is independent of others and only one check will be applied to each potential match.

Table 8: Matching checks across treatment (NDTMS) and Ministry of Justice data

Rule Number	Rule	Example
1	Swap attributors	IS280671F matched to SI280671F with same release dates (+/- 7 days)
2	First initial check	JC180483M matched to any person with different first initial [J] but holding rest of the attributors constant [-]JC180483M with same release dates (+/- 7 days)
3	Second initial check	MT180488M matched to any person with different second initial [T] but holding rest of the attributors constant M[-]180488M with same release dates (+/- 7 days)
4	Day of birth check	JA110971F matched to any person with one day difference in day of birth e.g. JA[10 or 09]0971F with same release dates (+/- 7 days)
5	Month of birth check	JA110971F matched to any person with one-month difference in month of birth e.g. JA11[10 or 08]71F 0971F with same release dates (+/- 7 days)
6	Year of birth check	GE170582M matched to any person with one-year difference in year of birth e.g. GE17058[1 or 3]M with same release dates (+/- 7 days)
7	Gender check	RC231263M matched to any person with different gender e.g. RC231363F with same release dates (+/- 7 days)

The approach to fuzzy logic matching was based on criteria set out by the Australian Government Open Data Toolkit²¹ as recommended by the Ministry of Justice (personal communication, 2019). The ‘Date of Birth’ was split into three separate identifiers. If all six identifiers match, then the two records will be paired off immediately to create a ‘perfect match’. No fuzzy matching will occur on either of the records after that point. A basic technique was used called ‘blocking’ - if 0 or 1 identifiers match, then the record pair will be rejected without any fuzzy matching being done. A weighting will be applied to each check (hereafter called a ‘soft-match’). Such probabilistic record linkage creates an algorithm that assigns a weight to a positive match or a non-match using two probabilities called u and m . The ‘ m ’ probability is the likelihood of the attributers matching and is determined as 1 minus the error rate. For example, gender is likely to be correctly recorded across data systems, so the ‘ m ’ probability will be close to 1 (a near perfect match). Other dynamic factors such as ethnicity or home location will have a lower probability of a match due to the way that field is recorded and whether the data captures change (such as moving address etc.).

u was calculated as the likelihood that the attributers across the datasets will match purely by chance. It can be considered also: if two data systems have two records belonging to two different people, what is the probability that they will match in any case? For example, for gender where there can be (mainly) two values of male or female, so the ‘ u ’ probability for gender is 0.5 (1/2). Extending this further, the u probability for any one of the twelve months of birth (and assuming a uniform distribution) is simply $1/12 \approx 0.083$. m is the probability that the attributers will agree and would be 1.0 if there is a perfect match, but as this can rarely be true, but it can be estimated. For example, if the matched birth month is the same, it is possible to decide a priori that $m=0.95$ and given that $u=0.083$ then the weight of a positive

²¹ https://toolkit.data.gov.au/Data_Linking_Information_Series_Sheet_4:_Probabilistic_linking.html

match (weight) is 3.51 and a non-match is -4.20²². A positive weight will be applied when a check creates a match, and a negative weight when it does not. Working across each record, a threshold can be applied that suggests the likelihood of a ‘correct’ match. To provide a basis for the weightings, an experiment was undertaken with dummy data. Two files of 5,000 records were created (e.g. with the same variable headings and dummy data). Individual changes to the attributors were manually made to allow for possible different threshold values to maximise correct matches and reduce false matches. A default Threshold was determined at 15.0. In a test, correct results were produced in all records. Consequently, a priori weights have been calculated using the following assumptions:

Table 9: Assigned values of m and u

Check	m	<i>U</i>
Same Initials	0.95	1/(26*26)
Swapped Initials	0.1	1/(26*26)
Date of Birth Match	0.95	1/(365*60)
Gender Match	0.95	0.5
Month/Day Transposed	0.2	1/(365*60*3)
Date within 31 days	0.95	1/(12*60)
Date within a year	0.95	1/30
Single initial match	0.95	1 - (1/25*25/26*26)
Same birthday	0.5	1/365

†m probability reduced to 0.1 from 0.2 after simulating results. Too many false positives were observed in test dataset.

²² A match is calculated by $\ln(m/u)/\ln(2)$; a negative match is $\ln((1-m)/(1-u))/\ln(2)$ where $\ln$ is the natural log function.

‘Soft matching’ was undertaken for areas that were likely to be common errors including swapped initials, month or day of birth transposed. Criteria for the match included: For the month and day to be a valid date when swapped around (e.g. if the date of birth is the 3rd May, then 1-9th of March will be matched) and for the date of birth to be within +/- 31 days.

The soft-matching process yielded over 8,000 potential matches. These were grouped and visually assessed. Despite this large number of potential matches, there was limited corresponding information that would permit assessment as to whether each match was correct. In the absence of full names, addresses or sentence details, the main marker was nationality, which did not support positive identification of duplicates as most of the people in prison were ‘white’; where different ethnic backgrounds were noticed, it was difficult to draw any clear inference. For example, a person may be recorded as ‘Black Caribbean’ on NDTMS and ‘Mixed Nationality’ on the Ministry of Justice dataset – it was difficult to determine with any degree of certainty what comprised a match. Therefore, the matching erred on the side of caution, by taking into account likely data entry errors or use of aliases that have been found in similar data linkage research. This included the likelihood of data system linkage error such as individuals altering initials and surname, being common means of creating aliases (Tibble et al., 2018; Larney and Burns, 2011).

The fuzzy logic method yielded 2,813 possible matches, an increase of 166 people in prison (an enhancement of 6%) from the original 2,647 direct one-to-one match. This resulted in a possible match of 60% compared to 56%. This is slightly lower than an initial 64% match found in an Australian data linkage study of offenders receiving methadone matched to mortality records (Larney and Burns, 2011) but higher than a 40% match of 56,867 Canadian people in federal prison to a registered persons database that included eligibility for

healthcare (McIsaac et al., 2016). A repeated logistic regression was run to test whether biases were maintained in the matching using additional variables available from PHE. This analysis confirmed the earlier finding of white, male and younger people in prison being more likely to match across the datasets. In addition, high-security, local and London prisons were all associated with not matching across the two datasets. It is unclear why individual characteristics or establishment features are associated with missing information. It may be hypothesized that both factors influence the matching process – London prisons for example, may have a higher proportion of ethnic minority populations and are served by a number of local prisons, which collectively may affect the likely levels of matching across the datasets. Aliases have consistently been shown to affect data linkage studies although the details and possible impact of this is not always captured. A case study of 24 offenders in Tuscon USA found that the entire sample had altered their name by changing spelling, completeness and sequence (e.g. inverting first and middle names) of their name, to inventing a new identity (Wang et al., 2004). A large-scale Canadian data linkage study found an average of 2-3 aliases *per person* with women reporting a slightly higher number of aliases (McIsaac et al., 2016). Studies examining aliases have shown variations in its usage are dependent on the type of offender. A US study of pre-trial arrestees compared a random sample of arrestees with ‘habitual’ offenders and found significant differences in the use of aliases, with habitual offenders averaging eight different aliases reflecting “*a broader tendency towards non-compliance and deception during interpersonal exchanges*” that may characterise the data collection process in prison settings (DeLisi et al., 2013:511). Similarly, an English study of people in prison within a high-security hospital explained name changes amongst high-tariff offenders as resulting from broken family ties, people in prison trying to make a fresh start and issues with their names itself including variations in spelling (Völlm et al., 2006).

Data linkage studies have tended to focus on matching using names, addresses, date of birth and gender which also offer more specificity than the concatenated list of attributers.

Adjusting for aliases has been shown to significantly improve the quality of data linkage studies, with “*a cautious approach*” advocated so that studies should examine direct matches and aliases separately (Larney and Burns, 2011:125). Studies using names have found that female offenders are consistently more likely to have aliases than men especially for ethnic minorities (Tibble et al., 2018; McIsaac et al., 2016; Martin et al., 2005). The effect of age is unclear. One Australian study linking correctional to mortality datasets found younger people more likely to have multiple aliases (Tibble et al., 2018) whilst another Australian study found older female people in prison on longer sentences more likely to have different names across two datasets (Martin et al., 2005).

These issues were summarised in a Canadian linkage study across people in Federal prison (McIsaac et al., 2016). This study found consistent underreporting for women, ethnic minorities and substance misusers, with ‘severe’ alcohol misuse being predictors of mismatching across multiple datasets. Studies linking datasets across criminal justice, health and other domains have found inherent issues in use of deterministic matching processes in that they result in potential false-negative matching, whilst probabilistic approaches may create a larger number of false-positive matches (Hser and Evans, 2008).

For this thesis, it is not clear why using deterministic and probabilistic data linkage methods did not produce better matches across the two datasets. This may imply that people in prison change their details more fundamentally and for reasons that are unclear. It may be possible that data capture systems are not effective in certain establishments that produce data errors (e.g. Hollin et al., 2004) and that the release dates may themselves be incorrect. The

implication is that the sample used in this study will not be representative of the entire AUD treatment population. The oversampling of younger, white male people in prison held in remand prisons may lead to overestimates of offending in the final sample derived for this study. Also, it has been shown that ‘habitual’ offenders are more likely to use aliases, which would also inflate reoffending rates. Further work is required to assess matching across criminal justice and health datasets using attributers. People in prison, therefore, were matched based on the characteristics of this sub-sample and any inferences as to a treatment effect will only be representative of this segment and not the full AUD treatment population.

9.5 Concluding Remarks on the Methodology, Strengths and Limitations

The main strength of this study is the derivation of a population that allows for the simulation of a randomised trial. This creates an opportunity to address the fundamental concerns with prospective cohort designs and allows for the discussion of provisional causal mechanisms that explain a treatment effect. Propensity score matching and regression adjustment estimators are some of the techniques that will be deployed to derive a treatment effect. The advantage of using such approaches is that they adjust for selection effects that may occur with randomisation. Moreover, these methods can arguably be seen as more transparent, as there is a literature encouraging publication on the extent of sample ‘balance’ (ensuring that the treated and comparison groups are equivalent). For this thesis, following sensitivity tests using both PSM and regression-based estimators, there is confidence that the two groups are more balanced to allow for comparability.

The deployment of adjustment methods to assess multicomponent treatment allows for a ‘real-world’ understanding of a treatment system and for a comparison of the effect of

multiple treatments. These are presented by tiers of robustness starting with “doubly-robust” approaches moving through to regression adjustment to describe a treatment effect. Most assessments of ‘treatment’ using quasi-experimental approaches take a binary approach (a single intervention) whilst ignoring that a wider treatment system will be multi-layered.

In addition, the approach links administrative datasets across public health and criminal justice comprising large sample sizes that incorporate static and dynamic attributes. As shown, the number of variables used in other comparable studies as part of the matching process is small and limited often to largely static factors. The inclusion of dynamic factors will ensure a more reliable comparison group is created. The scale of the study (national) allows for a more robust analysis of reconviction compared to other relatively small-scale studies, with small numbers of offenders across a single site. This study can, therefore, be considered to exhibit a high-level of external validity in that the findings can be generalised to a wider population.

The study also has limitations. As with this study, epidemiological studies have been criticised for significant levels of leakage and the fact that data are being used for purposes for which they have not been designed (Kidd and Matthews, 2017). Self-reported information given at assessment may be subject to biases in that people in prison may be incentivised to give certain responses. The data in this thesis are affected by missing a large proportion of the treated population (40-44%) which could not be matched across NDTMS and Ministry of Justice systems despite attempts to locate ‘missing’ people in prison using fuzzy logic matching. There are clear groups that were more likely not to match and the implications of this for estimating reoffending are unclear.

The study assumes that a person in prison defined by the offender manager as having an AUD is a diagnosis that has equivalence within a public health context. The OASys assessment is a pragmatic overview of a person's needs and although severity is recorded it is not diagnosed using a clinical DSM-IV or AUDIT framework. Therefore, it was not possible to identify 'dependence' as a specific clinical attribute. There may be differences in identification of AUD need depending on the perspective of the offender manager or clinician. It may be possible, therefore, for an offender to have a serious alcohol-related episode that resulted in a custodial sentence, and for a clinical screening tool to assume a 'mild' condition or be categorised as having no AUD²³. It is unclear what the treatment 'offer' is for this type of person in prison.

A key challenge when using administrative datasets is to derive meaningful descriptions of the treatment received. Community-based treatment effectiveness studies have examined the efficacy of broad treatment types (residential/in-patient; out-patient) and by pharmacology (e.g. methadone/buprenorphine). These options are more constrained in a custodial setting. NDTMS data describing the treatment received is limited to variants of 'structured psychosocial interventions' and 'alcohol prescribing'²⁴. Moreover, whilst the literature emphasizes RNR as a theoretical concept that is associated with treatment and reductions in reoffending, it can only be artificially created from NDTMS data. Therefore, RNR 'treatment' used in this study may not be part of 'real' treatment but rather a data artefact.

²³ I have interviewed people in prison who were convicted for an alcohol-related offence (e.g. domestic violence; burglary whilst intoxicated), but who were recorded as having 'no alcohol problems' on the AUDIT screening tool.

²⁴ Public Health England National Drug Treatment Monitoring System (NDTMS), Reference data Core dataset P (2019)

The thesis also takes prison leavers as a de facto measure of treatment completion. It is arguably an unrealistic proposition, as not all people in prison will have completed a programme of treatment due to short sentences, transfers to other prisons and there will be variability in access to treatment in the community. The fragmented nature of provision will be worsened by the impact of austerity that creates barriers to the delivery of therapeutic services. Moreover, there is limited information on treatment attrition. We know little of how many people in prison disengage from services or who were denied access, as this information is not routinely collected on NDTMS.

Although the use of static and dynamic data can be seen to be more sophisticated than models used hitherto in similar studies, there are other key factors that are not quantified in this method (as shown in Chapter Five). Although there is some scepticism (e.g. Travers et al., 2013) regarding the role that a person's motivation may play in the treatment process, there are other extraneous factors that should be considered. Staff attributes, the level of therapeutic engagement, satisfaction with the therapeutic alliance and organisational factors have all been shown to help explain differences in clinical treatment outcomes (Simpson et al., 2009; Welsh et al., 2008). Davidson and Young (2019) argue that people in prison may reframe their perceptions of treatment over time. Although the thesis includes dynamic factors such as employment and physical health need, these remain generalised concepts and are unlikely to encompass the entire nuance of offender needs (Farrington and Davies, 2007).

Overall, the thesis creates a unique opportunity to describe a provisional causal treatment effect within a neglected policy area (e.g. people in prison with an AUD). The methodology answers some of the criticisms levelled at studies of treatment effectiveness (namely prospective cohort designs) in terms of reducing selection effect biases. The approaches offer

the benefits of a randomised trial without the ethical and operational issues (or expense for that matter). Data linkages are however burdened with challenges including attrition when linking datasets, and with variable quality and availability of data. Yet quasi-experimental methods offer a glimpse at a future direction for understanding causality. Davidson and Young's (2019) mixed methods study provided a framework for combining quantitative and qualitative data to create a narrative that describes the fluid nature of the treatment process. Rather than considering treatment as a linear process, there is a need to understand how an offender receives, accesses and responds to treatment. Linkage across good quality datasets supplemented by bespoke instruments (e.g. one-off satisfaction/perception surveys) combined with in-depth qualitative interviews could be a more reliable, cost-effective and robust method to understand provisional causality. This will be explored more in the final chapter.

The thesis has also incorporated a small number of stakeholder interviews with key operational personnel involved in the delivery of AUD treatment in a custodial setting. This additional component strengthens the interpretation of the quantitative data by placing it within a real-world context, by adding the perspectives of operational staff delivering interventions to individuals with complex physical and emotional needs.

A final reflection relates to access to data for this thesis. This study was commissioned by Public Health England (PHE) which allowed for access to management information systems (NDTMS). Offender data was transferred directly from the Ministry of Justice to PHE as contractual arrangements only allowed for PHE to access all databases. The contractual arrangements of transferring data from one government department to another was also labyrinthine and final agreement of the final Service Level Agreement (Appendix III) took nearly one year to agree. Furthermore, PHE have enshrined within informed consent

arrangements given to treatment providers that only they will have access to raw data that may have personal identifiers (such as attributers). This means that at a national level, only PHE can undertake a matched data linkage analysis when treatment data are required. The implications of this are that it limits the replication of this type of study by other researchers. For this study, I was given temporary PHE employee status. This may create a sponsor bias in analysing and presenting findings, especially where the outcomes may be ambiguous. Researchers need to consider the likelihood of (and how to mitigate) such a sponsor bias when operating within an institution that oversees and manages access to all data.

Chapter 10: Findings

10.1 Introduction

This chapter presents the findings using quasi-experimental approaches using propensity score matching and the regression estimators to determine a causal treatment effect for prisoners with an AUD.

10.2. Estimating a Provisional Causal Effect for Binary Treatment: Propensity Score Matching

10.2.1. Description of the Treatment Sample

As there was no difference between deterministic and probabilistic methods (similar number of matches and the same biases), the direct one-to-one matched sample using the single ‘NOMISID’ match was used for the final analysis. Table 10 presents the crude (unadjusted) characteristics of the untreated control and treatment groups. Overall, the groups can be shown to be broadly similar with the non-treated control group more likely to be male and reporting a longer prison spell than the treatment group. In comparison the treatment group was more likely to be convicted of public order offences.

Table 10: Unweighted characteristics of the control and treatment groups

Prognostic	Untreated (Crude) [n=24,007]		Treated (Crude) [n=2,647]	
Male	22,507	93.8%	2,402	90.7%
Age, mean (SD)	31.86	(9.56)	32.5	(10.7)
Age at first offence (SD)	16.2	(5.9)	19.3	(8.8)
Previous Court Order	5.7		5.0	
Breach of Order	4.6		4.1	
Previous Offences	44.3		43.5	
Previous Prison Events	6.6		6.6	
Previous Convictions	19.5		20.9	
Criminal Damage	2.8		3.1	
Burglary	1.5		1.0	
Drink Driving	0.6		0.8	
Drugs import/export	0.2		0.1	
Drugs Possession	1.8		1.1	
Fraud	0.9		0.9	
Handling	0.9		0.5	
Other Burglary	1.7		1.4	
Public Order	3.1		5.7	
Robbery	0.4		0.3	
Sexual Offences	0.1		0.2	
Theft	8.8		8.0	
Theft of Vehicle	0.8		0.4	
Violence against Person	5.4		6.7	
Severity of Offence (low)	40.8		41.0	
Spell length (weeks)	51.6		39.2	

10.2.2 Estimating a Provisional Causal Effect for Binary Treatment: Propensity Score

Matching

The crude reconviction rate of both the treated and control groups (Table 11) show that the treatment group is likely to reoffend one-year post-release at virtually the same rate (43.6%) as the untreated, control group (43.7%).

Table 11: Crude reconviction rates of prisoners receiving multi-component treatment and comparison (untreated) prisoners

Treatment Modality	Did not reoffend		Reoffended	
Untreated Control Group	56.3%	n=13,510	43.7%	n=10,497
Treatment Group	56.4%	n=1,492	43.6%	n=1,155

Once the treated group has been matched to prisoners with similar characteristics the significant differences in reoffending are confirmed. No difference in outcomes were noted across caliper widths of 0.2 or 0.3, with no matches produced at 0.05 width. Although the measure of the ATE show the treatment cohort committed about 1% (ranging from -4% to +2%) fewer offences than the comparison group following release from prison, this is not statistically significant (Table 12).

Table 12: Average Treatment Effect estimator of proven reoffending at 12 months after AUD treatment, sensitivity analyses

AUD Treatment=1, Control =0	Average Treatment Effect (ATE)	P-value	95% CI Lower	95% CI Upper
Reoffending at 12 months (no OASys variables ²⁵)	0.064	<0.0001	-0.03	0.09
Reoffending at 12 months (selected OASys data)	-0.009	0.547	-0.04	0.02
Reoffending at 12 months (all OASys variables)	-0.013	0.387	-0.08	0.05

The above analysis shows differences in ATEs is sensitive to the matching approach. Excluding OASys data the analysis shows a 6% statistically significant increase in reoffending by the treated group compared to the untreated group. This is reversed when using dynamic data from OASys. Using all OASys outcomes establishes non-significant treatment effect estimate although it should be noted that the confidence intervals are wider compared to a more selective approach to data inclusion. This is consistent with findings from the wider literature (Bryson et al., 2002). Based on this analysis, the approach using a ‘trimmed’ selection of higher quality matches was utilized.

The supplementary research question to be answered explores a time-to-event analysis. The dependent variable in survival analysis is comprised of two components, the first is the time

²⁵ OASys data includes emotional wellbeing, thinking and behaviour, attitudes, health, employment, financial management, relationships, lifestyle and substance misuse (illicit drug and alcohol).

taken for an event to occur (such as reconviction) and the other is whether the event happened at all (whether a person was reconvicted or not). Two components are the survival and hazard functions. The survival component provides the probability of surviving (or not experiencing an event) up to that time. The hazard component states the probability for that event to occur given that an individual has survived up to the specified time. The models that are developed will need to include a range of covariates to help explain differences in reconviction rates. The hazard ratio (Table 13) also shows that prisoners in AUD treatment were 1.07 times more at risk of committing an offence during the year post release from prison compared to the untreated group and this difference was also not statistically significant.

Table 13: Time-to-proven reoffending from a marginal Cox regression model

AUD Treatment=1, Control =0	Hazard Ratio	P-value	(95% CI)
Reoffending at 12 months – 1	1.07	0.163	(0.974, 1.168)

10.3 Estimating a Causal Effect for Multicomponent Treatment: Regression

Estimators

Table 14 presents the crude reconviction rates for the treated and untreated populations using the derived treatment modalities. RNR-compliant treatment recorded the lowest rates of reoffending of all treatment modalities (36.5%) with PSI interventions (40.2%) also showing reoffending rates lower than the untreated group (43.7%).

Table 14: Crude reconviction rates of prisoners receiving multi-component treatment and comparison (untreated) prisoners

Treatment group	Did not reoffend		Reoffended		Total
	%	N	%	N	
Untreated	56.3	13,510	43.7	10,497	24,007
Pharmacological-only	46.2	339	53.8	394	733
RNR	63.5	153	36.5	88	241
PSI	59.8	1,000	40.2	673	1,673

Table 15 examines the treatment effect for each treatment modality. As expected, the larger the sample size, the less variability in the estimated reoffending rate, which was noticeable for the untreated group. Different methods yielded similar estimates for each treatment modality, except for the IPWRA method, which for RNR compliant treatment yielded an estimate of 0.756 compared to a range of 0.342 to 0.417 from the other three methods. A diagnostic look at the coefficients from the logistic regression models in the RNR compliant treatment revealed a malfunction called ‘convergence failure’ (Allison, 2008) in both the model for the reoffending outcome and for the treatment allocation²⁶. Therefore, the predicted reoffending rate of 0.756 for the RNR compliant group from the IPWRA method was deemed an unreliable estimate, with it being the highest of the four groups being

²⁶ The regression coefficients of four logistic models (one model per treatment) were screened for large values after exponentiation of their absolute values. Largest coefficient was ‘exp(8.18)’ which equals 3,570, and can be considered very large. This suggests that the logistic model on the binary reoffending outcome did not converge for treatment RNR. Convergence occurs when the data is right at either boundary of the permissible range or when there is "complete determination", e.g. nobody or everybody. For mathematical reasons (the logarithmic function), the statistical model cannot find a solution to its equations, which manifests itself in very large numbers for regression coefficients and larger standard errors.

compared and more than twice its crude rate of 0.365. Instead, across the other three methods (AIPW, IPW and RA) exposure to RNR-compliant treatment consistently yielded the lowest estimated re-offending rate of all four groups compared.

Table 15: Potential Outcome Means (POM) receiving multi-component treatment and comparison (untreated) prisoners by causal estimator

	Estimated Potential Outcome Means			
Treatment	Inverse Probability Weighted Regression Adjustment	Augmented Inverse Probability Weighting	Inverse Probability Weighting	Regression Adjustment
Untreated Control Group	0.435	0.435	0.436	0.436
Pharmacological-Only	0.514	0.527	0.531	0.505
RNR Compliant	0.756	0.417	0.342	0.412
PSI non RNR Compliant	0.450	0.450	0.424	0.441

Table 16 presents the risk differences between predicted reoffending rates for all treatment modalities, by each estimation method. The results for the RNR-compliant group from the IPWRA method are not interpreted, given the malfunction of its underlying logistic regression model. 99% coverage was needed to yield a set of 95% simultaneous confidence intervals (Chen and Hoppe, 2014). A single-step Bonferroni adjustment for multiplicity was applied to p-values from z-tests (Frane, 2015). The RA method, which unlike the other three methods does not use a weighting scheme, yielded no statistically significant result among

the six risk differences. The following tables present the absolute (Table 16) and relative (Tables 17, 18) measures as recommended by the Consolidated Standards of Reporting Trials (CONSORT) and the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) statements (Schultz et al., 2010) von Elm et al., 2007).

Table 16 presents the average treatment effect; Table 17 presents the same data using relative risk ratios²⁷; and Table 18 the ‘risk difference’²⁸. These tables present different effect measures, absolute and relative, as recommended in the epidemiological literature (Schultz et al., 2010) von Elm et al., 2007). Examining the risk differences (recommended in Gallis and Turner, 2019) show that the other three methods present an overall higher reoffending rate of the pharmacological-only group compared to the untreated group, with a statistically significant effect from both AIPW method (p-value = 0.0279, risk difference = 0.092, 95% Confidence Interval (CI) [0.008, 0.0176]) and IPWRA method (p-value = 0.0369, risk difference = 0.079, 95% CI [0.005, 0.154]). Only the IPW method yielded a statistically significant reduction in reoffending rate for the RNR-compliant group compared to the pharmacological-only group (p-value = 0.0072, risk difference = 0.188, 95% CI [0.039, 0.339]). Despite the reoffending rate for the RNR-compliant group being the lowest estimate for all four groups also from the RA and AIPW methods, the latter did not yield significant risk differences between the RNR-compliant group and any other group. This result can be explained by the small sample size of the RNR-compliant group being the limiting factor for the precision of its estimates.

²⁷ Relative risk ratios are differences calculated on the logarithmic scale of POMs, i.e. $\log(p(\text{untreated})) - \log(p(\text{pharmacological treatment}))$. Most analysts stop with Stata’s dedicated functions output, POMs & ATEs (risk differences), excluding Relative Risks. But a relative risk in this context is just a ratio of POMs. The dedicated `-nlcom-` function in Stata does all the computations needed except for the last step, the antilog.

²⁸ In other words the difference between two proportions: a difference between POMs: $p(\text{untreated}) - p(\text{pharmacological treatment})$. It is an absolute difference.

Table 16: Pairwise Average Treatment Effects (Bonferroni adjusted) across multi-component treatment and comparison (untreated) prisoners by causal estimator

Estimator	ATE	SE	Z	P > [z]	99% Confidence Interval ²⁹	
Regression adjustment						
Untreated vs Pharmacological Only	-0.149	0.060	-2.5	0.075	-0.302	0.005
Untreated vs RNR compliant	0.055	0.374	0.15	1.000	-0.909	1.019
Untreated vs PSI non-RNR compliant	-0.013	0.040	-0.33	1.000	-0.115	0.089
Pharmacological Only vs RNR compliant	0.204	0.379	0.54	1.000	-0.772	1.180
Pharmacological Only vs PSI non-RNR compliant	0.136	0.071	1.91	0.337	-0.047	0.318
RNR compliant vs PSI non-RNR compliant	-0.068	0.376	-0.18	1.000	-1.038	0.901
IPW						
Untreated vs Pharmacological Only	-0.197	0.070	-2.83	0.028*	-0.376	-0.018
Untreated vs RNR compliant	0.243	0.133	1.83	0.403	-0.099	0.584
Untreated vs PSI non-RNR compliant	0.029	0.043	0.67	1.000	-0.081	0.138
Pharmacological Only vs RNR compliant	0.439	0.149	2.94	0.020	0.055	0.824

²⁹ The Bonferroni correction was used to preserve an overall 95% simultaneous coverage for all confidence intervals reported. A single confidence interval for a single quantity has coverage 95% and needs no adjustment, as $1-0.05/1=0.95$. With four confidence intervals, the adjustment is $1-0.05/4=98.75\%$ which was rounded to 99% coverage.

Pharmacological Only vs PSI non-RNR compliant	0.226	0.081	2.78	0.033*	0.017	0.435
RNR compliant vs PSI non-RNR compliant	-0.214	0.139	-1.54	0.741	-0.572	0.144
AIPW						
Untreated vs Pharmacological Only	-0.192	0.062	-3.10	0.012*	-0.351	-0.032
Untreated vs RNR compliant	0.042	0.368	0.11	1.000	-0.905	0.988
Untreated vs PSI non-RNR compliant	-0.035	0.040	-0.86	1.000	-0.138	0.069
Pharmacological Only vs RNR compliant	0.233	0.373	0.63	1.000	-0.727	1.193
Pharmacological Only vs PSI non-RNR compliant	0.157	0.073	2.15	0.189	-0.031	0.345
RNR compliant vs PSI non-RNR compliant	-0.076	0.370	-0.21	1.000	-1.03	0.878
IPWRA						
Untreated vs Pharmacological Only	-0.167	0.056	-2.97	0.018*	-0.323	-0.022
Untreated vs RNR compliant	-0.553	0.133	-4.15	<0.0001*	-0.896	-0.209
Untreated vs PSI non-RNR compliant	0.035	0.040	-0.86	1.000	-0.138	0.069
Pharmacological Only vs RNR compliant	-0.385	0.144	-2.67	0.038	-0.7567	-0.014
Pharmacological Only vs PSI non-RNR compliant	0.133	0.069	1.94	0.262	-0.044	0.309
RNR compliant vs PSI non-RNR compliant	0.518	0.138	3.73	0.001*	0.161	0.875

*denotes significance at p-value =<0.05

Table 17: Calculation of Risk Ratios (Bonferroni adjusted) across multi-component treatment and comparison (untreated) prisoners by causal estimator

Estimator	Relative Risk	Lower Limit	Upper Limit	Bonferroni adjusted p-value
Regression adjustment				
Untreated vs Pharmacological Only	0.862	0.739	1.005	0.075
Untreated vs RNR compliant	1.056	0.403	2.771	1.000
Untreated vs PSI non-RNR compliant	0.987	0.891	1.093	1.000
Pharmacological Only vs RNR compliant	1.226	0.402	3.254	1.000
Pharmacological Only vs PSI non-RNR compliant	1.145	0.954	1.375	0.337
RNR compliant vs PSI non-RNR compliant	0.934	0.354	2.463	1.000
IPW				
Untreated vs Pharmacological Only	0.821	0.686	0.983	0.028*
Untreated vs RNR compliant	1.274	0.906	1.793	0.403
Untreated vs PSI non-RNR compliant	1.029	0.922	1.148	1.000
Pharmacological Only vs RNR compliant	1.552	1.056	2.281	0.020*
Pharmacological Only vs PSI non-RNR compliant	1.253	1.017	1.544	0.033*
RNR compliant vs PSI non-RNR compliant	0.807	0.565	1.155	0.741
AIPW				
Untreated vs Pharmacological Only	0.826	0.704	0.968	0.012*

Untreated vs RNR compliant	1.042	0.404	2.686	1.000
Untreated vs PSI non-RNR compliant	0.966	0.871	1.071	1.000
Pharmacological Only vs RNR compliant	1.262	0.484	3.296	1.000
Pharmacological Only vs PSI non-RNR compliant	1.170	0.969	1.412	0.189
RNR compliant vs PSI non-RNR compliant	0.927	0.358	2.401	1.000
IPWRA				
Untreated vs Pharmacological Only	0.846	0.732	0.978	0.018*
Untreated vs RNR compliant	0.576	0.408	0.811	0.001*
Untreated vs PSI non-RNR compliant	0.966	0.871	1.071	1.000
Pharmacological Only vs RNR compliant	0.680	0.469	0.987	0.038*
Pharmacological Only vs PSI non-RNR compliant	1.142	0.957	1.362	0.262
RNR compliant vs PSI non-RNR compliant	1.679	1.174	2.400	0.001*

*denotes significance at p-value ≤ 0.05

Table 18: Pairwise risk differences, Bonferroni adjusted across multiple treatments and comparison group, by estimating method.

Estimating method	Risk Difference	Standard Error	Z statistic	Adjusted p-value	99% Confidence Interval	
RA						
Untreated vs Pharmacological Treatment	-0.07	0.03	-2.33	0.118	-0.147	0.007
Untreated vs RNR	0.023	0.154	0.15	1	-.374	0.42
Untreated vs PSI	-0.005	0.017	-0.33	1	-0.05	0.04
Pharmacological Treatment vs RNR	0.093	0.157	0.59	1	-.0311	0.498
Pharmacological Treatment vs PSI	0.064	0.034	1.86	0.377	-0.024	0.153
RNR vs PSI	-0.029	0.155	0.19	1	-0.43	0.371
IPW						
Untreated vs Pharmacological Treatment	-0.095	0.037	-2.57	0.061	-0.190	0.0002
Untreated vs RNR	0.094	0.045	2.07	0.231	-0.023	0.211
Untreated vs PSI	0.012	0.018	0.68	1	-0.034	0.059
Pharmacological Treatment vs RNR	0.188	0.058	3.24	0.0072*	0.039	0.339
Pharmacological Treatment vs PSI	0.107	0.041	2.62	0.0528	0.002	0.213
RNR vs PSI	-0.081	0.048	-1.68	0.558	-0.207	0.044
AIPW						
Untreated vs Pharmacological Treatment	-0.092	0.032	-2.83	0.0279*	-0.176	-0.008

Untreated vs RNR	0.017	0.153	0.12	1	-0.377	0.412
Untreated vs PSI	-0.015	0.018	-0.85	1	-0.062	0.031
Pharmacological Treatment vs RNR	0.109	0.156	0.7	1	-0.294	0.513
Pharmacological Treatment vs PSI	0.076	0.037	2.07	0.2307	-0.018	0.171
RNR vs PSI	-0.033	0.154	0.21	1	-0.43	0.364
IPWRA						
Untreated vs Pharmacological Treatment	-0.079	0.029	-2.74	0.0369*	-0.154	-0.005
Untreated vs RNR	-0.321	0.100	-3.19	0.0085*	-0.580	-0.062
Untreated vs PSI	-0.015	0.018	-0.85	1	-0.061	0.031
Pharmacological Treatment vs RNR	-0.241	0.104	-2.31	0.125	-0.510	0.028
Pharmacological Treatment vs PSI	0.064	0.034	1.89	0.352	-0.023	0.151
RNR vs PSI	0.305	0.102	2.99	0.0167*	0.042	0.568

*denotes significance at p-value ≤ 0.05

10.4 Concluding Thoughts

10.4.1 Binary Treatment

When quantified by the ATE estimator that followed a propensity score match, a non-statistically significant 1% reduction in recidivism was noted for prison-based AUD interventions compared to a matched control group of prisoners. The findings are consequently inconclusive as to whether treatment for an AUD within prison directly affects changes in reoffending. This thesis hypothesizes that prison-based AUD treatment that focuses on addressing clinical needs resulting from excessive alcohol consumption will have a limited effect on reducing recidivism. It cannot therefore be assumed that engagement in any form of ‘treatment’ will automatically establish cognitive improvements that will facilitate reductions in reoffending post-release from prison.

10.4.2 Multicomponent Treatment

The study has explored the use of regression-based methods for estimating treatment effects on recidivism rates in an observational study context. It is of note that one of the ‘doubly-robust’ methods did not work as anticipated, contrary to what was expected in methodological literature (Linden et al., 2016). This thesis has suggested that caution is advised in the presence of groups with relatively small sample sizes. The small sample size of the RNR group caused its multinomial logistic model of the IPWRA method to malfunction, yielding an estimated recidivism rate much higher than its observed crude rate. Such malfunction may be avoided by gathering a larger sample size in the problem group, but this

being an observational study, group sample sizes were fixed. The problem was identified by comparing results from across the four statistical analysis methods deployed. It is therefore recommended that similar studies should report results from a range of statistical methods. This will minimise the risk of relying on estimates from a single modelling technique, which may be revealed as unreliable only when compared to estimates of the same quantity from other similar techniques.

The modelling of the effect of multiple components of correctional treatment for AUDs suggests that RNR-compliance could be the most effective intervention type compared to other treatments. RNR-compliant treatment was the only intervention arm that, except for one method, consistently yielded the lowest estimated rate of reoffending of all groups being compared. Further, pharmacological-only interventions were shown to produce statistically significant negative results on reoffending compared to the untreated group. Quasi-experimental approaches should be considered as an alternative to assess multiple treatments in correctional settings where there was no allocation according to a randomisation schedule. This study found one such method yielded unreliable estimates for groups of small sample sizes.

10.4.3 Methodological Implications

The thesis has compared multiple quasi-experimental approaches (propensity score matching and regression-based methods). Propensity score matching for binary treatment (treatment versus no treatment) has suggested a non-significant reduction in offending relative to the control group. The advantage of deploying additional measures aimed at examining multiple treatments has been shown whereby some interventions were more effective than others at

reducing reoffending (in order: RNR-compliant treatment, PSI, with pharmacological-only the least effective). This multi-method approach allows for a deeper understanding of the treatment mechanisms that will affect behavioural change. This is important because it suggests nuance is required when asserting the benefits of treatment. Yet this approach remains relatively limited as it does not reflect the full range of possible treatment combinations for treating an AUD. This was not possible for this thesis due to the small sample sizes that would occur and the greater possibility of failure in the models (as shown in the IPWRA approach).

It should also be noted that whilst pharmacological-only treatment resulted in increased levels of reoffending relative to the control group and other forms of treatment, it should therefore not be considered as purely iatrogenic. As shown in the qualitative Chapter (Chapter 6), there were many reasons why people in prison with an AUD would not consider psychosocial interventions. This included a perception that existing PSIs were geared towards drug misusers and did not ‘fit’ with patterns of alcohol consumption; different cognitive perceptions of the role alcohol has in their addiction; the ‘hierarchy’ of drug users above people with an AUD; and prisons prioritising health promotion over crime reduction as a focus of treatment. Therefore, it may be argued that pharmacological-only addresses immediate health needs but does relatively little to address criminal thinking³⁰.

This chapter has also shown that there is a need to assess the comparability of various treatment effect estimators to ensure a reliable and valid result is reported. Broadly, the results confirm a broad picture that treatment relative to a matched control group has limited

³⁰ I have undertaken several interviews separately to this thesis with people in prison who have stated that treatment has helped them become better (e.g. “fitter”) criminals by treating acute and chronic health conditions.

impact on reoffending outcomes. There is however, a degree of nuance with this finding, such that RNR-compliant treatment shows some promise relative to a control group. Yet the categorisation of RNR-compliant treatment can be considered an artificial coding construct, as NDTMS or Clinical Guidelines (Department of Health, 2017) do not recognise this intervention as a treatment. Therefore, although there will be some specifically designed RNR programs (Hamilton et al., 2015) it remains likely that most of the people in prison accessing treatment will be unaware that are receiving ‘RNR-compliant’ treatment.

Finally, the study has suggested that there is a need to open up the ‘black box’ of quasi-experimental methods. Use of static only measures created a treatment effect estimate that was then overturned using dynamic variables. This finding has important ramifications for treatment effect studies suggesting a need to present multiple estimates using different approaches and methodologies. Further sensitivity analysis has shown there is a trade-off between increasing or decreasing the number of covariates used to derive an estimate.

Increasing the number of covariates may lead to more robust estimates as the match across treated and untreated becomes closer. Yet as shown, ‘trimming’ the number of covariates due to data quality issues and imbalance will also improve the validity of the findings by reducing confidence intervals (Bryson et al., 2002; Heckman et al., 1997). More work is required to develop an adequate ‘engine’ of quasi-experimental methods to improve the quality of reported results. The implications of these findings are discussed in the final chapter.

Chapter 11: Discussion and Conclusions

This final chapter provides an overview of the main findings and interprets the results from the quantitative analysis in the previous chapter. Principally, the chapter addresses the overarching aim and seven objectives of the thesis. What is the effectiveness of treatment for people in prison with an AUD and do different treatments result in differing outcomes (Objective 2)? What insights do quasi-experimental approaches for observational studies offer in determining a treatment effect (Objective 1 and 3)? Also, is there a difference in the aetiology of problem drinking and offending that may explain the treatment effect identified in this thesis and how does this finding relate to the theoretic literature (Objective 4)? The conclusion will discuss practical implications for implementing quasi-experimental methods for observational studies in criminal justice settings (Objective 5) and end with suggestions for enhancing this approach methodologically (Objective 6).

11.1 Summary of Main Findings

11.1.1 Provisional Causal Treatment Effect: Binary Treatment

The estimation of the average treatment effect using propensity score matching for binary treatment show a 1% non-significant reduction in reoffending for prisoners treated for an AUD relative to their matched comparators in the control group. There was also no significant difference in the time-to-event analysis that suggested the control group **was** no more at risk of reoffending than people in prisoners treated for an AUD. As discussed previously, studies on effectiveness of criminal justice substance misuse interventions including AUD-only treatment have been inconclusive. Comparisons across studies are

difficult due to the heterogeneity in methods deployed, analytical approaches, interventions being examined, and criminal justice populations sampled.

Use of quasi-experimental approaches mimic randomization through creation of ‘similar’ matches between prisoners treated for an AUD and the untreated, control group. PSM approaches have largely focused on matching offenders on static factors such as age, gender and offending history and as shown in the findings chapter, this approach can now be viewed as problematic, as the sensitivity analysis has shown that use of static measures alone to balance the sample, leads to a 6% statistically significant increase in reoffending among the treated group compared to those untreated. This compares to a 1% non-significant *reduction* in reoffending when static and dynamic factors are deployed in combination.

For this thesis, a range of dynamic factors were included to enhance the matching process including emotional wellbeing, thinking and behaviours, physical health, employment, illicit drug use and lifestyle factors. Drinking patterns incorporating the extent of binge drinking and severity of use were also included. An advantage of this approach is that key correlates of engaging with AUD treatment including the extent and nature of alcohol consumption have been included as a match, as community-based studies have pointed to drinking patterns being a key correlate of a range of treatment outcomes (Peacock et al., 2018; Adamson et al., 2009).

It is argued that these dynamic factors are reflective of AUD treatment and recidivism outcomes and should form the basis of future treatment effects research in this field. There is also a need to ensure transparency in ensuring covariate balance. The propensity score match can be shown to be balanced using the visual approach advocated by Austin and Mamdani

(2006). Interestingly, sensitivity tests trimming for outliers outwith the threshold advocated by Austin and Mamdami (2006) were shown to have no effect on outcomes.

11.1.2 Provisional Causal Treatment Effect: Multicomponent Treatment

Following analysis of binary treatment outcomes, AUD treatment was divided into three groups relating to pharmacological-only (28%), RNR-compliant treatment (9%) and non-RNR compliant PSI (63%). It is notable that over one-quarter of all interventions were pharmacological-only with no PSI input. The reasons for this are unclear but are likely to reflect the nature of provision within a custodial setting. This may include prisoners receiving a short sentence or housed for a short spell, the availability of PSIs and an emphasis on treating the health-related consequences of alcohol consumption. It is also likely that receipt of pharmacological-only reflected the severity of alcohol-related needs that required a clinical response prior to any cognitive behavioural work. Research in the UK has found healthcare systems are relatively well-developed relative to psychosocial support especially for AUDs (Lloyd et al., 2019).

11.2 Interpretation of Findings

11.2.1 Treatment Works, Sometimes

Objective Two of this thesis was to derive and comment upon the nature of the resulting treatment effect. That is, are the findings consistent with the wider literature and does treatment for alcohol misuse require a different approach from therapies for other substances? Government documentation has been unequivocal in the assumption that ‘treatment works’

and that investment in treatment will yield criminal justice dividends through reductions in reoffending (Public Health England, 2017; Department of Health, 2017; 1996). The meta-analytical studies examining correctional structured treatment programmes is equally emphatic in the primacy of substance misuse treatment as a crime reduction tool (Weisbund, 2017; Holloway and Bennett, 2016). The evidence-base argues that treatment effectiveness is dependent on whether the eight “criminogenic needs” defined by Andrews et al. (1990) have been targeted. Treatment for AUDs in the UK places “*criminal involvement*” (Department of Health, 2017:15) within four essential elements of treatment addressing alcohol and drug misuse, health and wider social functioning.

Despite this emphasis, using PSM (static and dynamic factors), compared to the control group there was no difference in the crude (unadjusted) rate of reoffending for those treated, leading to a 1% non-significant difference when the treated and untreated groups were matched. This finding runs contrary to the accepted ‘treatment works’ axiom. Yet this may not be entirely surprising. First, as the review of the literature suggested, there is some heterogeneity as to a treatment effect for criminal justice interventions within a prison-setting and specifically for AUD interventions. In fact, the findings of this thesis of a minimal treatment effect corresponds with similar national quasi-experimental analyses and a prison-based prospective cohort study using administrative data (Hillier and Mews, 2018; Ministry of Justice/Public Health England, 2017).

In community settings there has also been concern that the outcomes for drinkers have been overlooked and that “*poor drinking outcomes represented an area of weakness requiring urgent attention by drug treatment services*” (Gossop, 2015: 51). Gossop (2015) also argues that the assumption of reducing offending derived from community treatment samples is

misplaced as this group and their criminal justice counterparts are distinct. It is likely that offenders who make the journey to community-based treatment are likely to be more motivated to make a change in behaviour. Also, as shown in Chapter Two, it can be argued historically that the national treatment system largely consists of interventions for treating opiate and stimulant addiction, with treatment for AUDs an afterthought. It is argued that alcohol interventions remain in the shadow of opiate-based treatment, with few examples of best practice in treating an AUD other than offence-specific approaches (for violent behavior or drink-driving).

Yet despite this equivocation, there are potentially positive findings when treatment adheres to RNR programming. RNR prioritizes more intensive treatment using relevant cognitive tools for higher risk offenders. This approach can be shown to demonstrate lower levels of reoffending than the matched control group. This contrasts to pharmacological-only interventions, which are shown to have a higher rate of reoffending compared to the untreated, matched control group. This finding is problematic as it can lead to an interpretation that treatment is iatrogenic to offenders with an AUD. The finding is also counter-intuitive, as national community-based treatment for AUDs has shown the effectiveness of pharmacological treatment in reducing offending (Willey et al., 2016). It has been argued that pharmacological treatment provided contemporaneously with PSI input is a fundamental requirement for behaviour change (Casey and Day, 2014; Fletcher and Chandler, 2006). To facilitate the joint approach between these two treatment approaches, NHS commissioning arrangements have established a mixed model of service provision often with NHS providers delivering clinical components and third sector providing PSIs. No one model dominates the operational landscape and treatment designs are considered fluid due to

recommissioning cycles (Duke, 2013; Fitzpatrick and Thorne, 2011; NHS England, 2018, personal communication).

As shown in the qualitative interviews within Chapter Six, it is also likely that provision of pharmacological-only treatment may reflect the severity of alcohol-related needs that required an immediate medical response prior to any cognitive behavioural work. This finding addresses an issue underpinning Objective Four of this thesis - whether people with an AUD differ from other types of drug user who may access treatment. Interviews suggested that dependent alcohol users were some of the most challenging requiring a stepped-care approach that manages immediate, acute health-related needs before addressing offending related issues. The interviews also highlighted how PSIs that are designed for illicit drug users may not transfer to individuals with an AUD. This presents a challenge to service provision for maintaining continuity-of-care at the point of release. It is also argued that services bidding for prison treatment contracts are obliged to comply with clinical commissioning priorities that reflect NHS standards of care (Kalk et al., 2018). It is argued that this may have established a focus on clinical priorities with interventions aimed at addressing recidivism a secondary facet of treatment. Moreover, the establishment of clinical services that underpinned IDTS are now established and embedded within prison systems.

Yet, there may be opportunities in designing an effective treatment system that addresses offending. Operationalising RNR treatment in a substance misuse context is complex, relying on individualised matching of prisoners to specific treatment types (Hollin et al., 2008b). Such an approach may be effective for smaller-scale interventions that are offence specific (e.g. for drink-driving). It is also difficult to achieve in practice and as the qualitative interviews show, interventions based on RNR programming such as CARATs defaulted to a

‘one-size-fits-all’ approach due to pressures to achieve performance targets. It is unlikely that prisons with high demand and a large churn will have the resources to assess and tailor treatment to each person on their caseload. This should be considered even more challenging in the context of austerity which has been shown to destabilise prison regimes and limit the effectiveness of commissioned services (Ismail, 2019; Ismail and de Viggiani, 2018a; 2018b; 2018c; Maguire and Raynor, 2017). Even with smaller caseloads offering fewer interventions, prisons have struggled to match people by offending risk to treatment ‘dose’ and tailored intervention (Hollin et al., 2008a; 2004). This failure to operationalise RNR principles can result in a default to more pragmatic, simpler/quicker/cheaper approaches resulting in low-quality interventions (Gendreau et al., 2002).

The literature on RNR has emphasised the role of cognitive behavioural therapy (CBT) as the primary treatment modality that can affect behavioural changes to facilitate reductions in reoffending (Landenburger et al., 2005; Wilson et al., 2005; Pearson et al., 2002). There is cognisance that treatment for substance misusers may require specialist, tailored components separate from a ‘general’ reoffending programme (Lipsey et al., 2007). CBT for prisoners aims to effect change by addressing criminal and substance-misusing thinking patterns by providing coping strategies to manage high-risk situations. Despite its attraction, other reviews have been more equivocal in its role in reducing recidivism (de Andrade et al., 2018; Perry et al., 2016) with commentators arguing that prison-based CBT interventions can default to vague, generic and untailored approaches as described above (Taxman and Cundy, 2005). Rather than adhere to treatment “brands”, commentators have argued for a focus on developing a therapeutic relationship or bond as part of a therapist-worker alliance (Day and Mitcheson, 2017; Day et al., 2013; Brocato and Wagner, 2008). The importance of the

therapeutic alliance has also been shown to be a key ingredient in community-based AUD treatment (PROJECT MATCH Research Group, 1998a; b).

The utilisation of RNR principles within prison-based treatment has also been shown to be problematic where multicomponent treatments coexist, and as demonstrated these separate components are rarely examined in combination for their role in reducing reoffending. Put another way, it has proved difficult to operationalise a coherent multicomponent treatment system that integrates RNR across treatment specialisms (e.g. with public health). Moreover, some commentators argue that many of the OBPs evaluated do not reflect routine practice and benefit from abnormal levels of funding and support (Lab and Whitehead, 1990) that in turn lead to higher rates of “*therapeutic integrity*” (Smith et al., 2009: 161). Although high severity of use has been shown to be associated with reoffending (Freestone et al., 2017; Caudy et al., 2015; Porporino et al., 2002), operationalising any forms of treatment for dependent and non-dependent prisoners that takes into account how consumption patterns change over time has been shown to be problematic (Taxman et al., 2006). Difficulties in understanding differential needs resulting from severity of use results in both groups being treated as one, homogenous grouping which as Marlowe (2011) suggests, may dilute a treatment effect on recidivism.

Austerity notwithstanding, the operationalising of any evidence-based approach has also been viewed as problematic within prison settings due to cultural, resourcing and leadership issues (Ismail and Viggiani, 2018a; 2018b; 2018c; Friedmann et al., 2007). Consequently, few prisoners may access the treatment they need, defaulting to non-evidence-based interventions such as group drug education (Pearson and Lipton, 1999), and interventions that are available may be delivered poorly (Marlowe, 2011). Few studies have focused on the ‘black box’ of

prison-based AUD treatment and evidence from English criminal justice settings suggests that the majority of PSIs delivered are limited in scope with little therapeutic content, focusing on administrative duties (Best et al., 2010; 2009). Little is also known as to the nature of alcohol interventions in custodial settings with some suggestion that commissioning of AUD-specific treatment is fragmented and lacking in strategic coherence (Criminal Justice Joint Inspection, 2016; Fitzpartick and Thorne, 2011; Duke, 2005).

There is also a suggestion that some substance misuse practitioners may be resistant to treating some people in prison who are more disruptive and lack motivation to change (Thanner and Taxman, 2003; White et al., 2001). There was some evidence from the qualitative interviews that this description could be applied to dependent alcohol misusers. Moreover, critics also argue that prison-based treatment will include people with tangential needs (e.g. involvement in activities relating to the production or supply of substances or with high rates of co-occurring disorders including suicidal thoughts, anxiety and depression, and generally in poor physical health) where AUD-specific treatment will have a diluting effect (Jolley and Kerbs, 2010). The authors also argue that clinical screening tools such as AUDIT may overstate the need for treatment by focusing on a person's immediate severity of use rather than addressing the antecedents of their alcohol-related offending. This concurs with my hypothesis that public health matters have primacy over offending needs which are temporally imbalanced (see below). Finally, we know little about staff perceptions of treating people in prison. Do commissioned services feel it is their role to effect change in reoffending, or do they perceive their role to be limited to treating immediate clinical needs? Medical treatment may be more straightforward to deliver in comparison to more nebulous psychological, talking therapies that require time to establish trust and therapeutic rapport with a person. Given staff interviewed for this thesis expressed reservations over using PSI approaches that formed the CARAT initiative, are staff confident they have the correct tools

to deliver changes in offending post-release? It is argued that from the qualitative interviews, staff perceived brokerage to other services to be the main mechanism of affecting change related to criminal behaviour. This, however, remains a major gap in the wider literature.

11.2.2 Alcohol the “un-drug”

Non-RNR compliant interventions were also shown to have no discernable treatment effect (with the exception of a lower rate of reoffending compared to the control group using the IPW estimator). This finding suggests that non-RNR compliant PSI interventions to address alcohol-related reoffending are ineffective. Different treatment effects (Objective 4) examined whether there was a difference in perceptions among people with an AUD compared to ‘traditional’ opiate or stimulant drug users. The qualitative interviews suggested that people in prison with an AUD framed their response to treatment in a different way to illicit drug misusers. Drug misusers were more likely to ‘blame’ their addiction, so cognitive therapies aimed at addressing relapse are likely to have some efficacy. By contrast, people in prison with an AUD tend to be more complex than drug misusers (Williams et al., 2015), attributing complex ‘social stressors’ (Calcaterra et al., 2014) such as personal histories, relationships and unemployment, as antecedents to their imprisonment. As these issues were seen as personal to each individual, there was limited perceived efficacy in structured group work, the foundation of prison-based structured treatment. Furthermore, treatment is largely focused on opiate users who have access to opiate substitution therapies as ‘hooks’ to ensure engagement and compliance. These pharmacological therapies do not exist in the same way for problem drinkers.

Studies of problem drinkers in the general population show differing perceptions of their drinking that differ from opiate or stimulant users. Many perceive treatment as total abstinence from drinking (Connor et al., 2016; Probst et al., 2015) with few viable treatment options (Wallhed Finn et al., 2015). In this context, individuals with an AUD perceive quitting or altering drinking patterns as a ‘personal’ matter rather than a requirement for treatment (Dunne et al., 2018; Schuler et al., 2015). Individuals with an AUD may also not be fully aware of their issue with alcohol or may be in denial of the extent of their problem (Probst et al., 2015). The extent to which individuals may be in denial may reflect the legality of alcohol in relation to illicit drugs, where excessive alcohol consumption is largely normative in British culture whilst drug misuse is more readily identified as a problem requiring a form of treatment (Davies et al., 2019).

Although there is evidence that increasing severity is associated with reductions in denial (Probst et al., 2015), there are also suggestions that public health messages have little salience (Wallhed Finn et al., 2014). A study of incarcerated non-dependent drinkers found similar issues with accepting public health messages. Whilst there was awareness of public health risks associated with drinking, these were dismissed as lower order concerns relative to immediate social and criminal justice needs (such as employment, housing and managing post-release supervision requirements), with drinking viewed as the last legal pleasure still available (Sondhi et al., 2016). Furthermore, as highlighted in the qualitative interviews, individuals with a severe AUD may suffer from a range of socio-economic issues such as unemployment, housing issues and relationship loss combined with physical and mental health issues (Rehms et al., 2015). The prevalence of comorbid mental health diagnoses has been noted in individuals with a severe AUD diagnosis (Lewis et al., 1996).

11.2.3 Public Health “Turn”: Equivalence of Care and Equity of Access

As part of the logistic modelling to create a control group for the PSM, it was shown in Chapter Eight that people in prison with an AUD who had been treated were more likely to be binge drinkers with higher levels of physical health needs compared to the comparison group of those untreated. Conversely, people in prison with an AUD and who committed offences related to their drinking were less likely to be in treatment. This suggests a health-based system that is focused on treating immediate health needs. Yet in the introduction it was noted that some commentators perceived drug policy as imbued by a ‘criminal justice turn’ as part of a wider ‘war’ on substance misusers. It is a contention of this thesis that this perception is somewhat hyperbolic, politically driven and does not reflect changes in commissioning practice in the last decade. Hunt and Stevens’ (2004) suggestion that government policy shifted from a focus on treating the harm caused by substance misuse to managing the harm committed by users should be reviewed in the light of a public health focus on substance misuse treatment (suggesting a shift back to treating harms to substance users). As suggested in the introduction, government policy rhetoric has also been subject to a degree of hyperbole and can be characterized by continuity rather than fundamental change (Shiner, 2013; Berridge and Hickman, 2007). Rather than a ‘war’ on substance users, this thesis contends that the criminal justice system has been used as a blunt instrument to funnel as many offenders as possible into treatment in the expectation that ‘treatment works’.

Since 2010, the NHS rather than the Ministry of Justice commission prison-based drug and alcohol treatment as part of the tri-partite arrangement (NHS England, 2018). Use of accredited OBPs have declined since 2010 with the largest fall noted in substance misuse services (declined by 76% in a five-year period from 2010) reflecting a shift towards

commissioning treatment systems that reproduce community provision (Ministry of Justice, 2018, personal communication). Implicit in this framework is the concept ‘equivalence of care’ across prison and community treatment based on a principle of universality where any person is entitled to access the same treatment in criminal justice settings as in the community (Niveau, 2007; Møller et al., 2007). The unintended consequence of this reframing is the tension created between guaranteeing universal, ‘equivalent’ treatment and delivering tailored and bespoke approaches for each person requiring a careful calibration of needs, and for reoffending, ensuring fidelity to RNR principles.

In practice, prison treatment will reflect a mixed model of third sector and NHS provision. The approach to delivering treatment in prison is underpinned by national guidelines on clinical management (Department of Health, 2017; National Institute for Clinical Evidence, 2011) that include small sections on criminal justice treatment. Although the IDTS model no longer officially exists, the legacy of the approach has been maintained into the changing commissioning landscape within revised clinical guidance. OBPs have also been largely decommissioned, replaced by a range of non-manualised PSI approaches including one-to-one cognitive therapies and structured group work that now are less likely to be focused on the offence but rather address remission by tackling alcohol-related cognitions and its relationship to criminal behaviour. Access to mutual aid including Alcoholics Anonymous and use of alcohol brief interventions also form part of the treatment options within custodial settings (Wheatley, 2019; Sondhi et al., 2016).

This reframing of prison treatment into a public health context has been predicated on the assumption that “*drug treatment significantly reduces drug-related crime*” (Department of Health, 2017; 13; Department of Health, 1996). As Gossop (2015) noted, this assumption

requires questioning, since use of psychosocial interventions addressing risk of relapse and minimising the harm from excessive alcohol consumption may dilute an effect on criminal behavior due to aetiological differences in both concepts (Farabee, 2018; Prendergast et al., 2013). A study of drinking and recidivism on UK offenders under a community sentence found changes in reoffending despite no significant change in drinking patterns, suggesting that different cognitive processes underpin alcohol consumption and criminal behaviour (Coulton et al., 2012). Furthermore, there are no references to RNR concepts found within the UK Orange Book guidance despite its unequivocal assertion of a treatment effect on offending.

Underpinning this reframing of treatment philosophy away from criminal justice needs to public health concerns, is the differential approach to defining and managing 'risk'. For public health practitioners, risk is related to the diagnostic identification of medical conditions alongside risk of relapse. In criminal justice settings, risk measurement predicts the likelihood of a future event such as reoffending, where the term 'clinical risk' is confusingly also used but applied to forensic psychology rather than to general public health (Helmus and Babchishin, 2017). These are two separate processes within the criminal justice system. As Hollins et al. (2008a) have shown, even in relatively small-scale interventions there are issues with grouping offenders by risk. This will be compounded in a treatment system that emphasizes the screening of all prisoners for any medical condition on arrival linked to the subsequent management of any diagnoses whilst incarcerated.

Whilst understanding risk of reoffending is deemed an essential part of a comprehensive clinical assessment of need, this requirement is subsumed within risks related to overdose, health risks of excessive alcohol consumption, risks of self-harm or harm to others (such as

safeguarding children). As suggested, actuarial risk tools (e.g. OGRS) are not routinely incorporated into clinical treatment, where use of diagnostic tools such as AUDIT that screen for problematic drinking and others that measure severity of dependence or withdrawal take precedence. AUDIT is also aimed at a general population, and it not specifically tailored to criminal justice needs in that there are no direct questions that relate to offending (MacAskill et al., 2011). There is also some suggestion that screening using health-based diagnostic screening tools does not fully capture alcohol-related needs (Kissel et al., 2015; Light et al., 2013; Maggia et al., 2004; Mason et al., 1997).

Moreover, there is a temporal imbalance that prevents the timely integration of clinical and actuarial risk measurements. The latter may be undertaken at some point prior to entry into prison by an offender manager and may predate a clinical risk assessment when a person in prison arrives into an establishment. What this means is that the immediacy of a clinical assessment at the point of arrival into prison prioritizes urgent health needs (e.g. symptoms or side-effects relating to withdrawal) and the categorization of a person into ‘dependent’ or ‘non-dependent’ treatment pathways. Identifying antecedents to problem drinking and its relationship to offending only occurs later in the treatment process *after* the referral has been made. This temporal imbalance in the sequencing of treatment results in a person potentially only receiving appropriate PSIs at some later point in their treatment. The implication of this is profound – this imbalance in sequencing results in clinical needs being addressed before criminogenic needs. If a person in prison is on a short sentence or stay in the establishment, or if the pathway between clinical and PSI services is fractured, then prisoners may only receive limited therapeutic support related to their offending. The impact of austerity may compound these fractures (Ismail, 2019) in the sequencing of a treatment response by preventing smooth transitions between clinical and PSI teams.

The study also requires further understanding of sub-populations within the AUD population. NDTMS did not routinely collect AUDIT scores and although these are collected on separate clinical management systems (such as ‘SystemOne’ provided by TPP used extensively in prison settings), these were not available for this study. Although there is an indicator of severity used on OASys, this should be validated by cross-reference to clinical diagnostic scores derived from AUDIT. This would allow for a more detailed analysis of AUD sub-populations (such as comparing outcomes for dependent and non-dependent prisoners).

A treatment effect is also subject to access to services or interventions once released. Continuity of structured treatment and ancillary care to facilitate reductions in reoffending has been demonstrated to be critical for incarcerated populations (Olsen and Lurigio, 2014; Prendergast et al., 2004; Inciardi et al., 2004; Prendergast et al., 2003; Hillier et al., 1999) and in improved treatment outcomes for community-based AUD treatment populations after discharge (Eastwood et al., 2018). This study has limited understanding of the extent and nature of post-release service engagement for all prisoners with an AUD. It should also be noted that the thesis covers a period (2013-14) prior to changes in supervision defined in *Offender Rehabilitation Act, 2014* (HM Government, 2014). The study time period will not include any supervision for short-term offenders and therefore there may be an expectation that future reconviction rates could improve based on enhanced probation support, although there have been concerns as to whether this has worked effectively in practice (National Audit Office, 2019).

11.2.4 Making sense of Recovery and Desistance

Much theoretical discussion has focused on concepts of desistance and recovery (e.g. Best et al., 2017). The literature identified that key to both concepts is a change of personal narrative or social identity away from a criminal or addict/alcoholic towards a prosocial self-image (Best et al., 2017; Paternoster et al., 2016; McIntosh and McKeganey, 2006; Maruna, 2001), as part of Giordano et al.'s (2002) theory of cognitive transformation. Yet there are fundamental questions as to how prison treatment can develop pragmatic interventions to support a cognitive shift in personal narrative in the context of reduced resourcing (Maguire and Raynor, 2017). Although approaches to prison-based substance misuse treatment placed within a recovery context have emerged (Lloyd et al., 2019; Lloyd et al., 2017; Best et al., 2017; Radcliffe et al., 2016; Powis et al., 2014), little is known about the specifics of AUD treatment and its possible effect on recidivism. What is more, as the qualitative interviews have shown, the introduction of recovery within prison settings is still largely an exercise in rhetoric (Duke, 2013; Duke, 2005).

Interviews with stakeholders suggested that prison staff have appropriated the language of recovery, but it is unclear how closely they align to concepts that could be applied to a prison setting. Van Roeyen et al. (2017) argue that whilst desistance has been operationalized as stopping offending, recovery in substance misuse treatment has focused on 'clinical' or 'personal' definitions, with an emphasis of managing levels and patterns of consumption. These are potentially contradictory definitions since, as this thesis has suggested, changing drinking habits and desisting from crime may have fundamentally different aetiologies. It is argued that the 'public health turn' in commissioning has sharpened the division between desistance and recovery, where the latter becomes a health condition that requires managing.

It is therefore suggested that treatment staff have focused on addressing individuals' immediate medical needs and that this falls within a 'clinical' or 'personal' definition of recovery. It is also likely that this is due to a differential conceptualization of risk. The focus of AUD treatment is the management of health-based risks resulting from excessive alcohol consumption. Whilst offending risk is routinely measured (e.g. OGRS scores) and included in assessments of need, these have reduced utility as health-based commissioned systems focus on managing clinical pathways. As suggested, qualitative interviews suggest that recovery for people in prisons with an AUD is largely an exercise in brokerage to outside agencies on release (Kratcoski, 2017).

11.3 Methodological Issues

Several thesis objectives relate to methodology. The finding of a non-significant 1% reduction in reoffending may reflect the methodologies used for this thesis. Outcomes from quasi-experimental methods may differ from prospective cohort designs for a number of reasons. Prospective designs take a baseline at initial assessment and calculate the difference in the number of offences at some point(s) in the future. Differences in reoffending are then assumed to be the consequence of a treatment effect. By contrast, causal methods provide a commentary on absolute and relative reoffending rates comparing a treated group with a comparison group. As stated above, the findings from this thesis are broadly in line with differential approaches examining prison-based treatment for an AUD using quasi-experimental and prospective cohort designs. The approach deployed in this thesis aims to replicate elements of a clinical trial and broadly speaking, it has achieved Objective One by confirming that quasi-experimental methods can be deployed effectively in criminal justice settings. This approach has been found to have a number of advantages and limitations

(Objective Three). It has advantages over prospective cohort designs to allow for some commentary on causal mechanisms. The quasi-experimental approaches also allow for a rigorous examination of selection biases that affect treatment outcomes. The establishment of accurate measures of matching treated individuals to a control group has been shown to be pivotal. Moreover, it was possible to utilise the entire dataset after PSM so that no cases were omitted. Omission of cases (that cannot be matched due to lack of overlap) is a key objection to PSM (King and Nielsen, 2016), but this was not a factor for this study. Furthermore, it is a contention of this thesis, that the approaches adopted to estimate a treatment effect for prisoners with an AUD are novel and have not been used in this way hitherto. Whilst there is a small literature on PSM approaches in UK substance misuse settings (Hillier and Mews, 2018; McSweeney et al., 2018; McSweeney, 2015), there have been no studies at the time of writing, in substance misuse that have examined treatment effects using multicomponent modelling, and none combining binary and multicomponent treatment methodologies.

Nonetheless, a key finding from this thesis is that the reoffending outcome using PSM for binary treatment, is dependent on variable inclusion such that the direction of the outcome can change from a non-significant positive effect on reconviction (by including OASys data) to a significant negative effect (excluding OASys). A key objective of the thesis has been to derive practical implications of using quasi-experimental methods in criminal justice settings (Objective 5). Use of dynamic offender assessment has rarely been used in quasi-experimental methods in the substance misuse field which has focused on routinely available static measures such as age, gender and offending history. Assuming these findings hold for other quasi-experimental studies using PSM that did not incorporate dynamic prognostics, the result is that this may understate a possible treatment effect and result in erroneous outcomes. This has huge potential implications for treatment effects research. This finding of a possible

change in direction of a treatment effect depending on what data are available is a major shortcoming in quasi-experimental designs.

A key question to be asked is whether offender assessments are an accurate portrait of offenders' needs. Assessment of community-based assessments suggest issues with the quality of the data which is confirmed in this thesis. There has been some suggestion that OASys assessments in the community are of poor quality due to inconsistencies, inaccurate recording and excessive brevity (Fitzgibbon, 2008; Crawford, 2007), although the interpretation that OASys data are fundamentally inaccurate has been challenged (Metha, 2008). For the purposes of creating an appropriate control group, it is required that offender assessment should be a close description of offender needs. The findings from this thesis suggest that there are fundamental issues with using OASys data in terms of coverage and skewness (where some responses gravitated some away from the average). This may be a problem of collecting dynamic information. An individual's personal situation may change over time, and this may be particularly so for those with acute and complex needs. For the purpose of this study, we assumed that those covariates that were 'trimmed' were those most problematic. Here, 'problematic' data was defined as a mix of poor coverage (missing data of more than 40%); skewness and issues of imbalance following matching. The implication is that some covariates essential in the selection process have been omitted which will create biases rather than eliminate it (Copp et al., 2018; Heckman et al., 1997). For this thesis, key prognostics were excluded due to quality of data issues (such as mental health, housing, finances and attitudes to relationships). Future reconviction studies should ensure these are included and with more effort made to ensure offender assessments are adequately completed. Moreover, decisions as to whether to include a prognostic is left up to the individual researcher. It remains unclear whether data quality issues are paramount when

matching datasets using similar information. It is a finding from this thesis that good quality data should be prioritised rather than ensuring all data items are automatically included.

Inclusion of better-quality data refines the reconviction estimates by reducing confidence intervals which has been highlighted elsewhere (Hernán and Robins, 2020; Bryson et al., 2002; Heckman et al., 1998). As both the whole OASys and ‘trimmed’ datasets produce confirmatory outcomes in terms of direction, magnitude and significance, we can state with some confidence, that reducing covariates may have had only a marginal effect on reconviction estimates. It is hypothesized that this is due to a relatively large number of covariates included in the ‘trimmed’ group. It may be the case that there is an optimal number of dynamic covariates that can be deployed, and any additional measure will only secure marginal improvements. We can conclude that inclusion of dynamic factors is an essential prerequisite when creating the control group for offender populations. A study using PSM in estimating parental incarceration also found outcomes switched when covariates were trimmed (Copp et al., 2018).

Furthermore, additional sensitivity tests at different caliper distances also found no difference in reconviction outcomes. Sensitivity testing and assessment of the quality of data should be transparent during the matching process (Cook and Steiner, 2010). Few published studies present sensitivity analyses using alternative approaches to sample selection. This is due to studies deploying data dependent on what is available rather than on a theoretical understanding of the relationship between prognostics and treatment (Friendship et al., 2003). At present, age, ethnicity, gender and offending history form the main approaches to matching individuals using PSM methods. Deploying offender assessment information should be examined in depth with justifications given to their inclusion or omission rather

than inclusion due to availability. The conclusion that can be drawn from this, is that there is a need to establish a robust control group that is founded on a well justified inclusion of covariates that are related to the selection process. It is argued that use of dynamic variables must be included in matching processes.

Furthermore, there are issues in the development of the weighted modelling for multicomponent treatment. Only a fraction of the total covariates could be included in these models. This illustrates some of the limitations of a multinomial logit model used for the weighted models, magnified by the small sample size of the RNR compliant group. The loss of key covariates could affect the reconviction estimates. There is a limited literature on how to address these shortcomings and what does exist, focuses on medical statistics and econometrics.

The thesis also highlights the importance of diagnostic ‘balancing’ tests to ensure close approximation of the treated and control groups. The binary approach using PSM has been able to demonstrate adequate balance based on absolute standardized scores and variance ratios. Balance was achieved by removing variables that were outliers. Without adequate balancing, caution is required when making causal statements even provisional ones. It is a contention of this thesis that few studies present adequate information on which to judge balance. Yet I also argue that there is no consensus as what to do with unbalanced data. For this thesis, unbalanced variables were ‘trimmed’ from the final analysis, yet there is no definitive agreement on what the threshold should be. Shadish and Steiner (2010) highlight an absolute standardized difference of 0.2 may result in significant imbalance, creating large biases in the treatment effect estimates but without giving a definitive threshold. Austin and

Mamdani's (2006) recommendations, which have been used in this thesis, suggest a cut-off of 0.1, but the authors acknowledge that this figure is arbitrary.

The finding of a null treatment effect on reconviction using PSM was further explored using the weighted multicomponent modelling suggesting that prisoners do respond differently to discrete treatment arms. The extent of heterogeneity in recidivism following treatment remains problematic and understanding the nature of this variation should be a focus of future treatment effects research. In particular, there is a limited discussion in the literature on the inclusion of covariates (aside from the broad need to control for treatment selection). It is hypothesized that despite the inclusion of OASys dynamic variables as discussed above, there remain key omissions that underpin entry and engagement into treatment. There is no information on a person in prison's motivation for treatment (Rosen et al., 2004) although there is a suggestion that this factor may be overstated (McGuire, 2006). This thesis argues that for people in prison with an AUD, as suggested in the qualitative interviews, there is a fundamental difference in attitudes and motivation to change in comparison to drug misusers.

Few studies have also considered satisfaction of the treatment received as a covariate, and it is suggested that this is an omission in the literature. We also know little about satisfaction levels in prison-based substance misuse treatment other than that it is nuanced, incorporating a mix of historical and current perspectives (Sondhi and Day, 2012). In addition, there is little information on a person's life events that can act as 'turning points' (Carlsson, 2012).

Organizational attributes and the service delivery model have also been shown as important (Kelly et al., 2017) with a suggestion that these factors are intrinsically linked to an individual's motivation for treatment (Welsh et al., 2008). There is, therefore, an opportunity

to leverage supplementary analyses on organizational functioning alongside motivation and satisfaction levels within a wider treatment effect (see below).

Use of multicomponent treatment effects modelling is an emerging approach in statistical medicine and this thesis has focused on the methodological work by Linden et al. (2016) in medicine. These approaches have been developed using weighted effects modelling focused on ‘doubly-robust’ measures and have created reconviction estimates for different treatment ‘arms’, highlighting the role of RNR-compliant treatment and the negative effects for pharmacological-only approaches. ‘Doubly-robust’ methods offer a more sophisticated measurement as one element of this approach models the outcome (reconviction), and the other the treatment selection covariates. Whilst this is useful in determining the relative effectiveness of treatments, this approach could be considered artificial and does not reflect ‘real-world’ interventions. The categories of treatment arms were based on a count of interventions delivered and deriving a composite group ‘RNR-compliant treatment’ may be a statistical artefact rather than an actual intervention. It is unclear to what extent the RNR-compliant treatment offer exists in practice, although there is some indication that some prison-based interventions are still based on this approach (Hamilton et al., 2015). The analysis of RNR-compliant treatment suffers from small numbers receiving this intervention (n=241). This has resulted in problems in creating an appropriate control sample as the small numbers resulted in the model failing to converge and in reducing the number of covariates available for modelling. This presents a notable constraint on using regression-based models to establish a treatment effect. Here, large and possibly blunt groupings of treatment are required. Whilst providing statistical stability to estimates of a treatment effect, this reduces any nuanced understanding of what is provided.

Both approaches are affected by the leakage of data when linking administrative datasets across criminal justice and public health. Just over half (56%) of people in prison who were treated and recorded on NDTMS were known to criminal justice datasets using a unique identifier. Attempts at enhancing the matching using fuzzy logic only yielded a small likely increase to 60%. This was due to confirming matches were the same person with only limited available information. Six potential sources of biases were identified including socio-demographic characteristics where (a) younger people in prison were more likely to match; (b) females less likely to match; (c) black and minority ethnic groups were less likely to match. The prison system was also a factor: (d) high security prisons; (e) local/remand prisons and (f) London prisons were all less likely to result in a match across the two datasets. This has implications for the interpretation of the findings. First, there is no clear reason why there is such a level of missing data using a common, unique key, but it has been found also in other matching studies using NDTMS and criminal justice data (Public Health England 2019, personal communication). The non-random element of missing data suggests that there are some fundamental issues relating to use of aliases or uncommon names alongside data recording issues. Busy London or remand prisons with high churn may suffer from data recording accuracy. Further work is required to identify the source of the mismatch in records. Second, the treated dataset is only a subset of those exposed to treatment. This suggests that we cannot be certain if a person in prison who was identified in the control group may have accessed treatment, but this event was not recorded. This will limit the strength of the findings.

11.4 The Future: Towards Robustly Measuring a Treatment Effect

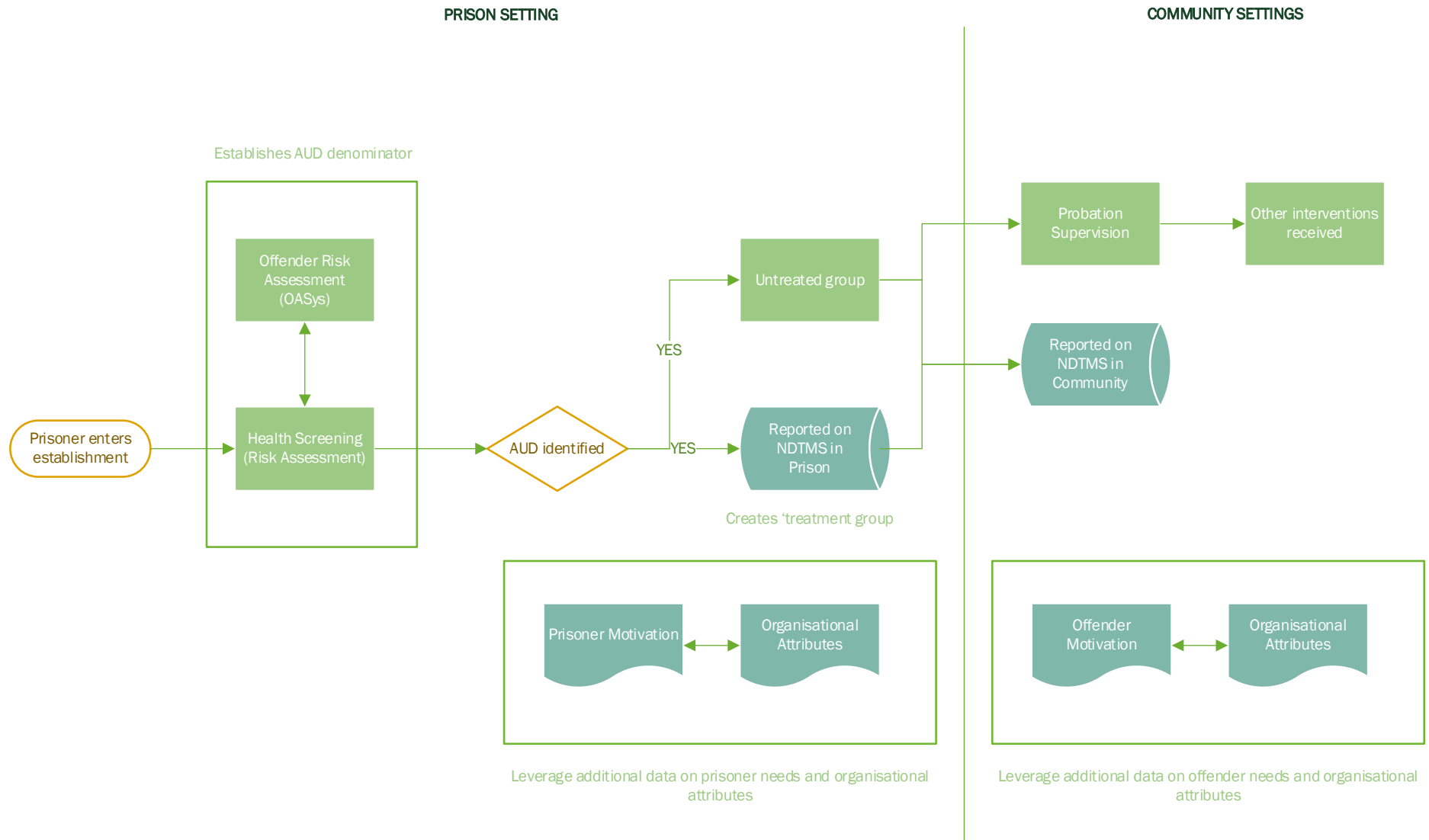
This thesis suggests that use of emerging quasi-experimental approaches can be effective in furnishing the building blocks to derive a provisional causal treatment effect. However, the approach can be enhanced to minimize the limitations described above, and the section below describes a model of good practice in deriving a treatment effective (Objective 6). The need to create a comparison group was achieved in this thesis by utilizing dynamic offender assessments held in OASys. This could be boosted through utilization of clinical health management information (SystmOne) collected at the point of arrival into an establishment. AUDIT data collected at this stage could be linked to OASys data to provide a detailed description of the AUD prison population that would provide detail of drinking severity (e.g. dependence). This approach will require understanding how an individual's details link from one management information system to the next. As shown in Chapter Ten, there is a mismatch in records across data systems. The first component of an enhanced model measuring treatment effectiveness should undertake data quality checks and in particular, test the linking of data across management information systems. Leakage of data should be minimized as far as possible.

The creation of a comparison group should be carefully considered with learning from undertaking randomized trials incorporated into the methodology, and inclusion of dynamic data held as part of offender assessments should be included. Interviews with practitioners and people in prison should test the theoretical assumptions held about the factors of who seeks and receives treatment and inclusion of each variable should be justified. As shown in the Findings Chapter, data quality should be considered, and sensitivity testing should be applied to test the impact of missing or poor-quality data on the reconviction outcomes. The

quality of data was seen to reflect the time-period used in this thesis and there is some suggestion that the quality in record keeping has improved over time (Ministry of Justice, 2019, personal communication). Methods of imputing missing information were limited due to the scope of poor-quality data held within OASys. Assuming improvements in data quality are realized over time, multiple data imputation methods could be considered.

It is further hypothesized that organizational factors such as therapeutic climate and intrinsic measures such as motivation and satisfaction with treatment alongside capturing episodes of life-changing events such as bereavement or birth of children will also be moderating factors. These measures could be leveraged into different prison types (e.g. by location and category) and on release to capture perceptions in the community through surveys or bespoke questions added to offender assessments. National studies may not be required, but sampling of different prison types (e.g. remand, trainer), by geography and by gender may be a more effective way to determine a treatment effect. The role of continuity-of-care including access to sentencing requirements, supervision arrangements and community treatment should also be incorporated. The extent and nature of post-release community supervision has been identified as a key element of offender management, with some suggestion that this process has been relatively weak (National Audit Office, 2019). Perceptions of the relationship with the offender manager on release should also be incorporated. A summary of these suggestions is shown below in Figure 7.

Figure 7: Proposed Model for deriving a Causal Treatment Effect on Reconviction



11.5 Conclusion

The thesis finding of a null average treatment effect using PSM on reconviction rates for prisoners receiving binary treatment for an AUD, should be seen in the light of findings from the multicomponent treatment analyses. This suggests a degree of nuance in contrast to blunt messages about treatment ('nothing works' or 'treatment works'). Rather this study concurs with Martinson's (1978) revised conclusion about offender treatments: some treatments have promise in reducing reoffending (RNR-compliant treatment); some are neutral (other forms of PSIs) and some may be detrimental (pharmacological-only). One may hypothesize therefore that prisoners with an AUD may respond differently to different treatment approaches.

Consequently, this thesis suggests a more nuanced stance away from the conventional assumption that 'treatment works' in reducing reoffending. It is argued that the statement does indeed hold, but only in certain circumstances, namely when treatment programming incorporates RNR concepts although it is not known exactly which component (risk, need, responsivity) and in which combination establishes the most change. It is contended that the difference in outcomes is in part due to methodological design issues. As shown, prospective cohort designs suffer from a range of biases including significant selection biases which may overstate a causal treatment effect on reconviction. As Gossop (2015) notes, there is no direct comparability between community treatment clients and those in the criminal justice system (although there will be some overlap). Prospective cohort designs also suffer from a lack of control group limiting the definitive conclusions that can be drawn, as association differs from causality (although this has not prevented the findings from being interpreted in such a way). It is also argued that understanding treatment needs for AUDs are also more

nuanced than using approaches that have been borrowed from opiate-based treatment. People suffering from AUDs require tailored interventions that are cognizant of different perceptions of treatment need. It is suggested that prisoners with an AUD will frame their treatment differently than ‘traditional’ opiate users. A greater understanding of these perceptions and treatment needs is required.

The English treatment system for prisoners with an AUD has moved a long way since the introduction of IDTS in 2006. As a researcher working across the criminal justice system during this period, I have observed and researched these changes. Prior to IDTS, people in prison suffering from AUDs were left to go ‘cold turkey’ as part of ‘just deserts’. Now, there are clearly defined treatment pathways and guidance on managing the symptoms of alcohol withdrawal. Processes have been established to determine need on reception. The thesis contends that discussions around ‘*criminal justice turns*’ in treatment are outdated. Changing commissioning arrangements have established the primacy of public health over criminal justice needs. The principle of ‘equivalence’ has ensured that NHS commissioned services in the community are replicated in prison settings. This reframed ‘*public health turn*’ has emphasized clinical models of treatment, displacing offender behavioural programmes. No clinical, commissioning or best practice guidance documents refer to RNR as a way to reduce reoffending. Findings from this thesis suggest that this is an oversight that should be addressed.

The deployment of novel, multiple quasi-experimental methods to determine the treatment effect for prison-based treatment has highlighted nuances to reconviction outcomes. It is suggested that methods should consider incorporating these approaches to avoid blunt ‘yes or no’ findings. The science underpinning these approaches is still relatively immature and will

require resources to determine the full extent of its approaches across criminology and addiction. That said, quasi-experimental approaches also have substantial methodological strengths. A main advantage is that they explicitly and transparently address selection bias. Use of ‘balancing’ diagnostics establishes transparency in deriving a matched control group. The balance tests undertaken for this thesis suggest that the treated and control groups were considered relatively balanced, allowing for ‘like-for-like’ comparisons.

The main conclusion methodologically from this study, is the effect of including dynamic variables on reconviction estimates. This altered the outcome from a significant negative treatment effect to a non-significant positive outcome. ‘Trimming’ dynamic variables held on OASys resulted in relatively minor differences in outcome suggesting that there is a fundamental requirement for including these covariates into future treatment effect modelling. The heterogeneity in reconviction estimates when using or omitting dynamic data from OASys is, however, a cause for concern and limits the confidence of any claims on (provisional) causality. It is a contention of this thesis that despite relatively balanced samples, the selection effects omit key components of the treatment experience including motivation, attitudes, satisfaction levels, the occurrence of life events and likely compliance with treatment. It is argued that individuals with an AUD are different from their opiate or stimulant using counterparts in how they frame their response to treatment. To support this, there is a need to leverage supplementary analyses to provide a commentary on the effect of these intrinsic measures. In addition, there is a need to provide additional analysis on the extent and nature of post-release supervision, support and treatment.

Overall, the creation of control groups using both PSM and multicomponent weighted modelling are highly sensitive to what can be viewed as arbitrary decisions taken by the

researcher, which reduces the replicability of these approaches. Moreover, there is very limited discussion of these issues in the literature, heterogeneity in approaches, and little consensus on best practice. It is argued that there are crucial points in the methodologies that require consideration of covariate selection including assessing data quality, testing and refining imbalance levels, agreeing to what is considered ‘balanced’ and which sensitivity tests should be utilized.

There is an opportunity to underpin the development of quasi-experimental approaches through improvements in data quality and in linkages of administrative datasets across public health and criminal justice. A number of under-utilized datasets exist, and these could be combined in more creative ways to describe a person’s needs (whilst also addressing leakage between systems). The importance of quality of the data held in these datasets cannot be overstated. Quasi-experimental approaches will help address the shortfall in existing research on treatment effects where ‘correlation is not the same as causality’. Statistical techniques are being developed in fields as diverse as medical statistics and econometrics. But these approaches, however attractive, should be viewed cautiously and more transparency in methods is required including reporting outcome estimates using a variety of methods to test robustness, rather than relying on one favoured method. Leveraging robust supplementary analyses should be considered to test assumptions, examine in detail the inclusion of covariates with the aim of testing the credibility of derived estimates. These approaches will enhance the plausibility of causal inferences derived from observational data and in turn enhance the credibility of future policy directions.

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APPENDIX I: QUALITATIVE QUESTIONNAIRE



Prison Alcohol Treatment Reconviction Study - (Policy Leads and Operational Staff Questionnaire) v1.1

Name of Interviewee

Date:

Introduce study and run through the information sheet. Complete consent form.

1. What is your current role?
2. At this point in time, what services or interventions are available for prisoners with an AUD?
3. Has the nature and type of interventions changed over the last few years? If so, how?
4. How are these interventions commissioned?
5. Can you describe the process by which prisoners with an AUD can access interventions?
6. In your opinion, what are these interventions trying to achieve (health, social or reoffending goals)?
7. How does the concept of recovery work in your service?
8. Do you feel that prisoners with only an AUD are significantly different clinically from other prisoners with an illicit drug use problem? If so, how?
9. Thinking about these interventions, what do you think works well?
10. What works less well?
11. Are there any barriers for prisoners receiving or accessing an intervention; or for staff implementing them?
12. For prisoners with an AUD, are there any interventions or services that you would like to offer but are not doing now?
13. Is there anything else you would like to add that we haven't covered so far?

APPENDIX II: PARTICIPANT INFORMATION SHEET



PARTICIPANT INFORMATION SHEET (For Professionals/Practitioners) Version 1.1 8/11/17

1 Prison Alcohol Treatment Re-Conviction Study

You are being invited to take part in a research study. Before you decide, it is important for you to understand why the research is being done and what it will involve. Please take time to read the following information carefully and discuss it with others if you wish. Ask us if there is anything that is not clear or if you would like more information.

2 Purpose of the study

This study is funded by Public Health England in partnership with the Ministry of Justice. The aim of this study is to examine the effectiveness of prison-based treatment in England for prisoners with an alcohol use disorder (AUD). The study will focus on prisoners who receive treatment for an AUD only and not for illicit drug use. The main component of this project is a statistical examination of reconviction rates among prison leavers in 2013-14 compared to a derived sample of 'similar' prisoners (for example, by socio-demographic characteristic; offending behaviour etc.) who did not receive treatment. We also wish to understand how prison services deliver interventions for prisoners with an AUD in terms of what is delivered and how. We are keen to understand whether service provision has changed significantly in any way (for example, modes of delivery, interventions used). This study will provide information on the efficacy of prison-based treatment including an understanding of what drives reoffending and what factors help prisoners desist from further criminal activity post-release.

3 Why have I been chosen?

We are aiming to interview a sample of 8-10 government policy leads and operational providers with extensive knowledge of treatment interventions for prisoners with an AUD. The interviews will focus on your perceptions of how services meet the needs of prisoners, examples of good practice, and any potential barriers to implementation. This will include your views on which components of treatment you may find effective (or not so helpful). We will also be interested in your views as to how services may have changed over time to meet prisoners' needs. Your knowledge and experiences will be of great value to this study. For UK registered nurses and midwives you will not be liable to the NMC code (www.nmc-

uk.org/Nurses-and-midwives/The-code/) as the interview will not discuss an individual patient's health.

Interviews will be arranged at a time and place convenient for you. Please note that you have the right to refuse to answer any questions and to withdraw from the interview at any time. With your permission, interviews will be tape-recorded, and these recordings will be destroyed after the completion of the project.

4 Do I have to take part?

It is up to you to decide whether or not to take part. If you do decide to take part, you will be given this information sheet to keep and be asked to sign a consent form. If you decide to take part you are still free to withdraw up to one month after interview, after which time withdrawal is not possible after data amalgamation.

5 What will happen to me if I take part?

If you decide to take part, one of our interviewers will arrange an interview with you. The discussion will take about 30-45 minutes. With your permission, the interview will be recorded and then typed up.

6 What are the possible disadvantages and risks of taking part?

We do not expect you to experience any risks from participation in the study. We hope that you will find participation interesting as we will approach the interview as a discussion which will allow you to express your views freely. If you wish, we can keep in touch and provide you with feedback from the study.

7 What are the possible benefits of taking part?

The information we get from this study will help to inform how alcohol services can be enhanced for prisoners with an AUD and provide evidence of factors that may support desistance from crime post-release back into the community.

8 Will my taking part in this study be kept confidential?

All information collected about you will be kept strictly confidential. Confidentiality will be broken only in the unlikely event of someone deemed at risk. Your contact details will be kept separate from the interview material. Tapes and transcripts will be given a numbered code and kept in a locked cabinet accessible only to the researchers employed on this study.

Written and taped materials will only be read and listened to by the researchers. Any information about you which is used will have your name and address removed so that you cannot be recognised from it.

All data will be stored, analysed and reported in compliance with Data Protection Legislation.

9 What will happen to the results of the research study?

The results of the study will be made publicly available in a variety of ways - research reports, publications in academic journals and/or presentations at conferences. All reports and publications arising from the study will be in such a format that no one will be able to identify you.

10 Who has reviewed the study?

The Middlesex University, Health and Social Care Research Ethics Sub-Committee has reviewed the study.

11 Contact for further information

If you would like further information about the study, please contact:

Professor of Health Policy
Middlesex University
B.Thom@mdx.ac.uk; +44 (0)20 8411 5519

Thank you for taking part in this study.

You will be given a copy of this participant information sheet and the consent form to keep.

APPENDIX III: SERVICE LEVEL AGREEMENT

DATA SHARING MEMORANDUM OF UNDERSTANDING

THIS MEMORANDUM OF UNDERSTANDING (the Agreement”) is made on the 26 day of May 2017

BETWEEN

THE SECRETARY OF STATE FOR JUSTICE of 102 Petty France, London SW1H 9AJ (“MoJ”)

AND

THE SECRETARY OF STATE FOR HEALTH acting through its executive agency Public Health England, an executive agency of the Department of Health, of Wellington House, 133-155 Waterloo Road, London, SE1 8UG (“PHE”)

BACKGROUND:

- (A) Data sharing between MoJ and PHE is necessary to increase the understanding of the links between offending and alcohol treatment. See Section 2 for more details.
- (B) This agreement is for a one-off data sharing project to support a reconviction study.
- (C) The MoJ and PHE will all be responsible for compliance with the Data Protection Principles under the Data Protection Act 1998 and other data protection legislation in relation to the Shared Information and this Agreement exists to provide a framework for that compliance.

IT IS NOW AGREED as follows:

1. DEFINITIONS AND INTERPRETATION

1.1 In this Agreement the following words and phrases shall have the following meanings, unless expressly stated to the contrary:

“**Act**” means the Data Protection Act 1998, as amended;

“**Data Controller**” has the meaning in section 1(1) of the Act. For this project:

- MoJ will be the data controller for MoJ data (prisons, prison/probation interventions and OASys data extracts) and for Police National Computer (PNC) data which is the basis for the main PNC extract and re-offending data extracts. The provision of PNC data is based on a separate agreement between the Justice Statistics Analytical Services (JSAS) unit within MoJ and the Home Office (HO). This agreement sets out that the HO will provide JSAS with PNC data to update their PNC database which is to be used for research and analytical purposes, with a key use being analysis of re-offending. In line with the agreement, MoJ have a Memorandum of Understanding (MoU) with the PNC Information Access Panel (PIAP) to share PNC Data with third parties on the condition that they follow data share processes.

- PHE will be data controller for National Drug Treatment Monitoring System (NDTMS) data.
- PHE and MoJ will be joint data controllers for the matched datasets which will be stored at PHE for the time periods outlined in this agreement.

“Data Processor” has the meaning in section 1(1) of the Act;

“Data Protection Legislation” means the Data Protection Act 1998, the EU Data Protection Directive 95/46/EC, the Regulation of Investigatory Powers Act 2000, the Telecommunications (Lawful Business Practice) (Interception of Communications) Regulations 2000 (SI 2000/2699), the Electronic Communications Data Protection Directive 2002/58/EC, the Privacy and Electronic Communications (EC Directive) Regulations 2003 and all applicable laws and regulations relating to Processing of personal data and privacy, including where applicable the guidance and codes of practice issued by the Information Commissioner;

“Data Subject” has the meaning in section 1(1) of the Act;

“Environmental Information Regulations” means the Environmental Information Regulations 2004, as amended, together with any guidance and/or codes of practice issued by the Information Commissioner or relevant Government Department in relation to such regulations;

“FOIA” means the Freedom of Information Act 2000, as amended;

“Parties” means the parties to this Agreement, namely MoJ and PHE;

“Personal Data” has the meaning in section 1(1) of the Act;

“Sensitive personal data” has the meaning in section 2 of the Act;

“Project” means the steps described in Clause 6 of this Agreement comprising linking MoJ records to PHE data;

“Processing” has the meaning in section 1(1) of the Act;

“Request for Information” means a request for information or a request under FOIA or the Environmental Information Regulations;

“IAO” means Information Asset Owner, namely the individual occupying the position of Information Asset Owner within the MoJ and PHE, who has asset ownership obligations in relation to the Shared Information;

“Shared Information” means the information to be shared as set out in Clause 5 of this Agreement;

1.2 In this Agreement:

- (a) the masculine includes the feminine and neuter;
- (b) person means a natural person;
- (c) the singular includes the plural and vice versa;

(d) a reference to any statute, enactment, order, regulation or other similar instrument shall be construed as a reference to the statute, enactment, order, regulation or instrument as amended by any subsequent statute, enactment, order, regulation or instrument or as contained in any subsequent re-enactment.

1.3 Headings are included in this Agreement for ease of reference only and shall not affect the interpretation or construction of this Agreement.

1.4 References in this Agreement to Clauses, Paragraphs and Annexes are, unless otherwise provided, references to the Clauses, Paragraphs and Annexes of this Agreement.

1.5 In the event and to the extent only of any conflict or inconsistency between:

(a) the provisions of the Clauses and the provisions of the Annexes, the provisions of the Clauses shall prevail; or

(b) the provisions of this Agreement and the provisions of any document referred to or referenced herein, the provisions of this Agreement shall prevail.

2. PURPOSE

2.1 There is strong evidence that alcohol use is strongly correlated with offending, with alcohol cited as a factor in nearly half (47%) of all violent crimes in England and Wales (Walker et al, 2009). Alcohol is also implicated in criminal damage, domestic violence, sexual assaults, burglary, theft, robbery and murder. Offenders have been identified as having a higher prevalence of alcohol problems compared to the general population (Newbury-Birch et al, 2009). In a recent survey, 70% of prisoners admitted to having been drinking when committing the offence for which they were incarcerated (Alcohol & Crime Commission, 2014).

2.2 Prison-based services for alcohol use disorders have been viewed as limited, pointing toward considerable unmet need for on-going treatment and support (HM Inspectorate of Prisons, 2010). Studies have shown that for pre-trial prisoners, 81% reported drinking at levels requiring an intervention, and of these, only those identified as dependent were likely to access an in-house service (Kissell et al, 2014). In this context, the treatment options for problematic alcohol users in prisons have been under-resourced. While there has been dedicated funding for drug treatment for the past ten years it has only been since 2010 that these provisions were extended to include alcohol.

2.3 Whilst the links between alcohol and offending are clear there is a very limited understanding of whether investment in alcohol interventions delivered in prisons results in reduced levels of alcohol-related offending. In addition, previous studies looking at proven re-offending amongst individuals who have received substance misuse treatment have been unable to establish a counterfactual (i.e. what would have happened had treatment not been received).

2.4 Ministerial approval (Department of Health) was granted in late 2015 for a national study to explore the impact of alcohol treatment on reconvictions. PHE have contracted an external supplier of research studies and evaluations, Therapeutic Solutions, to undertake the study. Specifically, the study will test whether proven re-offending is reduced amongst prisoners with an identified alcohol-only problem (excluding any other addiction to other illicit substances) as a consequence of their treatment whilst in prison. The study will comprise of two work-streams: (a) a

quantitative study of the impact of structured alcohol treatment in prisons on proven re-offending post-release, and (b) a qualitative study which aims to establish which elements of alcohol treatment interventions have a positive effect on reducing excessive alcohol consumption and how this, in turn, impacts on reconvictions.

- 2.5 This data sharing agreement is concerned with the first work-stream (a). The quantitative research will be innovative and seeks to link a range of available datasets: National Drug Treatment Monitoring System (held by Public Health England), Police National Computer (PNC), prisons datasets and prison/probation interventions and Offender Assessment System (OASys) to describe the characteristics of prisoners who misuse alcohol (attributes and history); what interventions have been provided and whether these interventions (and in what combination) are effective in reducing proven re-offending. The quantitative analysis will also aim to determine what factors predict reduced reoffending amongst alcohol misusers.
- 2.6 A key component of the study will be to derive a comparison group in which to compare reconviction outcomes (Propensity Score Matching). A matched sample will be created that will examine the outcomes of prisoners with similar attributes to those who receive treatment for alcohol whilst in prison. The comparison group will be matched on prisoner characteristics (age, gender, ethnicity etc.), exposure to offending interventions and type of offending to ensure a like-for-like comparison is made. This counterfactual approach will test the hypothesis that specialist treatment produces superior outcomes (by reducing the levels of offending) compared to prisoners with the same characteristics who receive no treatment.
- 2.7 The overall aim of the matched MoJ-PHE data is to gain a better indication of the effectiveness of alcohol treatment programmes in custody. It will help build the evidence base and provide insight into the personal characteristics (such as ethnicity, gender and age), offending and treatment characteristics of individuals with more or less successful outcomes after treatment. This data share will not be used to identify or monitor the outcomes of specific individuals. All published analysis will be of cohorts which will not enable individuals to be identified.
- 2.8 Safeguards will be in place to ensure the protection of the matched data. This includes ensuring the matched data will be anonymised, stored on a secure server at PHE only, with access to the data strictly controlled to a limited number of individuals who can be named on request. The terms and safeguards (e.g. ensuring data is stored on a secure server, with access to the data being strictly controlled to a limited number of individuals who can be named on request) of this data sharing agreement will apply to any files created using the data share.
- 2.9 The steps comprising the Project are set out in Clause 6. This Agreement does not relate to any data sharing between the Parties not forming part of the Project.

3. COMMENCEMENT AND TERM

- 3.1 This Agreement shall commence upon signature by the Parties and shall continue in effect until the Project has been completed in accordance with the requirements of this Agreement unless otherwise subject to earlier termination in accordance with Clause 18.

4. REPRESENTATIVES

- 4.1 The MoJ and PHE will each appoint a representative to be the primary point of contact in all matters relating to this Agreement:

For the MoJ:

Head of Data Linking Team (or in the event this specific role changed, its successor)

For the PHE:

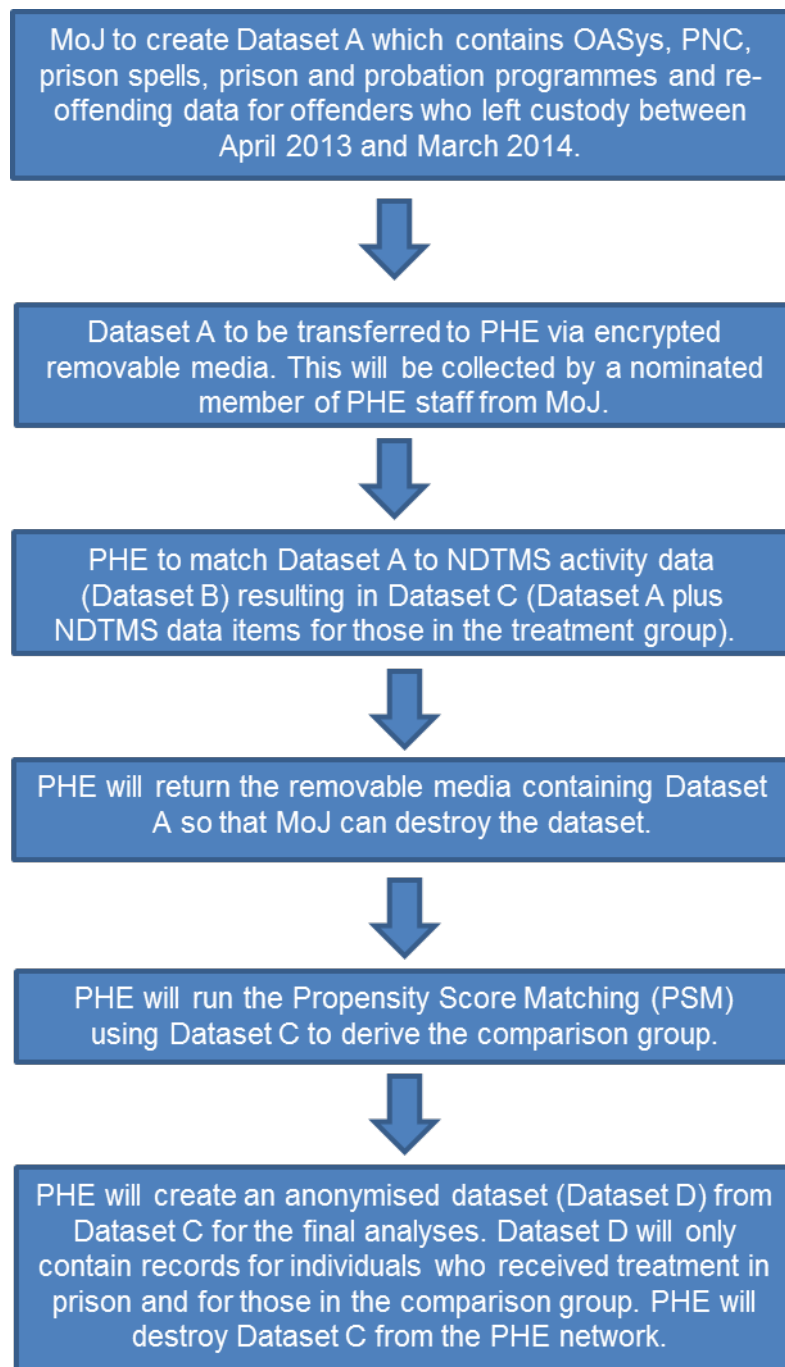
Head of Analysis (or in the event this specific role changed, its successor)

- 4.2 MoJ and PHE will create a joint Working Group which will agree the matching rules and document the group's common understanding of the resulting data analysis. MoJ and PHE will provide each other with the names of the members to be appointed to the joint Working Group and update each other as necessary. The joint Working Group shall meet within one month following signature of this Agreement and at regular intervals (at least quarterly) thereafter.
- 4.3 The persons who will be supervising the Processing of the Shared Information are John Marais (Head of Data, Improvement, Analysis & Linking team, MoJ) and Brian Eastwood (Programme Manager, Outcomes and Research, PHE).
- 4.4 The persons who will be processing the Shared Information are analysts from Justice Statistics Analytical Services in MoJ and the Evidence Application Team (EAT) in PHE, including the contracted study provider (Therapeutic Solutions) and Alisha Cooper from the Criminal Justice Team at PHE, who will conduct analysis within the secure environment at PHE, alongside the Evidence Application Team. The representatives from Therapeutic Solutions and Alisha Cooper will only process the data within PHE having signed the PHE NDTMS confidentiality agreement and having successfully completed levels 1 and 2 of the civil service mandatory information governance training³¹.
- 4.5 For the purposes of this project MoJ are data controllers of the data on prisons, prison/probation interventions, OASys and PNC data that the project will seek to link with data held by PHE (for details of the data to be shared see **Annex B**). This is set out in the 'data controllers' section on page 2.
- 4.6 Access to the data covered by the Agreement shall be limited to the minimum number of individuals necessary to achieve the purposes set out in the Agreement. From PHE, the individuals to access the data shall be Brian Eastwood, Tim Lowden, Alisha Cooper (or their replacements). From the study contractor, access will be given to Arun Sondhi.

5. SHARED INFORMATION

- 5.1 **Figure 1** (overleaf) outlines the data flows and transfer method to be used for the Project.

³¹ <https://digital.nhs.uk/information-governance>



Section 6 provides more detail on the data being transferred and **Section 10** expands on the security protocols in place.

- 5.2 The list of variables included in the data share will be the minimum amount of information necessary in order for the project to meet its objectives, and will be agreed by all parties. Further details as to why such variables are necessary at each particular stage are set out in the table at **Annex B**.

6. THE PROJECT

- 6.1 The Project will consist of the following steps of which the Parties are in agreement and acknowledge their respective obligations. This project governs the sharing of data for research and analysis purposes

only (this includes evaluation and monitoring purposes). This Project utilises a statistical technique called Propensity Score Matching (PSM) to compare individuals receiving alcohol treatment in prison with individuals with similar characteristics who did not partake in treatment. It would only be possible to undertake PSM by transferring a wider group of participants and non-participants as part of Dataset A. It would not be possible to identify participants from a dataset shared after matching and this would reduce the accuracy of the comparison group used in the PSM and overall value of the Project.

6.2 Dataset A will be transferred from MoJ to PHE by encrypted removable media. The data will be transferred securely using a Kingston DataTraveller secure USB drive in line with the assessed impact level of the data. This USB drive is password-protected and becomes unusable if three incorrect passwords are entered. The password set will be strong (i.e. will contain at least 9 characters of upper and lower case, numbers and special characters, so containing enough entropy for OFFICIAL information). The datasets will be collected in person by a nominated member of PHE staff from MoJ - 102 Petty France.

6.3 **Dataset A** will include personal identifiers for linking datasets (PNOMIS Number and individual's initials, date of birth and gender) and variables for an estimated 80,000 records from the following categories (see **Annex B** for more detail):

- Police National Computer (PNC) data items
- Prison data items
- Prison/probation interventions data items
- OASys
- Reoffending data items

6.4 PHE will telephone/email MoJ to confirm safe arrival of the data and to gain the password for the encrypted removable media.

6.5 Dataset A will be copied to and stored on the PHE secure, password protected network. Access will be limited to members of the Evidence Application Team and the contracted study supplier who will be based with the Evidence Application Team (please see the Representatives section for exact names).

PHE will return the removable media through a nominated member of PHE staff. MoJ will securely destroy Dataset A on the removable media device and will confirm that this has been completed within one day of receipt of the media device.

6.6 PHE will match Dataset B (NDTMS data) to Dataset A using personal identifiers to create Dataset C. PHE (NDTMS) does not hold any full names of clients (an individual who is receiving structured drug and/or alcohol treatment in England). Dataset A will be destroyed from the PHE network once Dataset C has been created and tested. Both sides will confirm that these deletions have been completed (See also 6.5).

6.7 Dataset C will be stored on PHE's secure, password protected network. PHE will run the PSM on Dataset C. Access to Dataset C will be limited to individuals named in 4.6. Once the PSM has been completed Dataset D will be created – Dataset D is a subset of Dataset C containing only those individuals that will be included in the study, those in the treatment group and those in the comparison group (approximately 20,000 individuals in total). Dataset C will be deleted from the PHE

network within three months of the original transfer of Dataset A. This minimises the amount of time that unnecessary information is retained on PHE's secure network.

- 6.8 Dataset D will have had all of the personal identifiers removed. There is, however, a minimal yet theoretically plausible risk of using the offending datasets to examine patterns within the data to potentially identify a small proportion of individuals. We will mitigate against this by masking all variables that could be used to achieve this.
- 6.9 PHE will maintain Dataset D on their secure network and PHE will run analyses on Dataset D at PHE. Dataset D will be held on PHE's secure network for a maximum of three years from the date of receipt of its creation. Dataset D will not be shared with MoJ for the reason outlined in 6.8.
- 6.10 Arun Sondhi (Therapeutic Solutions) and Alisha Cooper (PHE) will need to access the secure environment within PHE to conduct analyses on the datasets, and will have to sign and adhere to PHE's NDTMS confidentiality agreements. MoJ analysts will not have access to Dataset D. The following safeguards will be in place:
- (a) A secure folder on the network will be set up which only a limited number of analysts from EAT and Arun Sondhi (study contractors) will be able to access;
 - (b) Access is only given to those analysts who confirm that they have carried out the mandatory information governance training and agree to PHE's NDTMS confidentiality agreement;
 - (c) The secure folders have limited access (access needs to be approved by a senior statistician); and
 - (d) Access will only be given for as long as is needed.

7. LEGAL BASIS

- 7.1 The MoJ enters into this data share agreement in exercise of the powers conferred on the Secretary of State under section 14 (4) (c) of the Offender Management Act 2007.

PHE's confidentiality toolkit permits linking NDTMS data with other governmental departments' data within PHE, as set out below and under section 6 of the confidentiality toolkit. PHE are content with powers cited for MoJ and that the consent gained in the confidentiality toolkit is sufficient legal basis for PHE.

"Data is matched from the NDTMS with other government datasets to produce statistics which help evaluate the success of treatment programmes. All data matching is conducted by Public Health England, and at no point is any identifiable information about clients passed onto other government departments. Data-sets that are used in this way include (but are not necessarily limited to)

- Drug Intervention Programme
- Police National Computer
- Department of Work and Pensions.
- Other routine health data-sets (e.g. Hospital Episode Statistics)

Under no circumstances is potentially identifiable data made public or provided to other government departments”.

This data share is compliant with the data protection principles provided for under the Data Protection Act 1998, in particular;

a. The processing of personal data is fair and lawful and necessary for the MoJ and PHE to perform their functions (schedule 2, paragraph 5). For the same reason it is necessary to process sensitive personal data (schedule 3, paragraph 7).

The parties to this agreement undertake this data-share in order to achieve the policy outcomes outlined in clause 2 of this agreement. The volume and type of data to be shared is the minimum amount necessary for the parties to achieve these outcomes.

Both parties publish fair processing notices³² on their websites informing individuals that personal data may be shared for research purposes.

b. The data processed is adequate, relevant and not excessive in relation to the purposes of the project.

Datasets A contains the minimum amount of personal identifiers required in order to allow for robust matching. The justifications for sharing the proposed volume and type of personal data in Dataset A are set out in Annex A and B to the Agreement.

c. Data shall be kept up to date.

At the point of extraction from the relevant databases³³ both MoJ data and PHE data will be up to date. Thereafter, for the purposes of this data sharing agreement, the shared information will not need to be kept up to date. Paragraphs 9 and 10 set out how the shared information will be securely processed in order to preserve the accuracy of that information.

The data being shared will not need to be kept up to date.

d. Personal data shall not be kept for longer than is necessary for the purposes it is processed.

The destruction obligations for the datasets created under the Agreement are set out at clauses 6, 15 and 16. Dataset D shall only be retained for a maximum of three years from the date of dataset linkage.

e. Data shall only be processed in accordance with the rights of the data subject.

The processing of data under this agreement is compatible with the rights of data subjects under the Data Protection Act 1998. Both parties publish fair processing notices that inform individuals that their personal data may be processed for research

³²https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/448296/Information-charter.pdf

³³ The relevant database in respect of PHE data being the NDTMS. The relevant databases in respect of MoJ data being the PNC, prisons, probation and OASys data extracts.

purposes. Clause 9.3.k to the agreement makes provision for the lawful handling of personal data access requests.

f. Appropriate security arrangements should be in place for the data to be shared, accessed, stored and used.

Paragraphs 9 and 10 of this agreement sets out the security requirements for the protection of the shared data.

g. Personal data processed under this agreement shall not be transferred to a country or territory outside the European Economic Area unless that country or territory ensures an adequate level of protection for the rights and freedoms of data subjects in relation to the processing of personal data.

- 7.2 For the purposes of this project MoJ are data controllers of the PNC data and PHE are data controllers of NDTMS data as set out in section 1.1.

8. FURTHER USE OF SHARED INFORMATION

- 8.1 All parties agree not to Process the Shared Information, except as necessary for the performance of the Project and to achieve the purposes in paragraph 2.
- 8.2 PHE agree not to onwardly disclose Dataset D.

9. PROTECTION OF PERSONAL DATA

- 9.1 This project is compliant with the Data Protection Act 1998; in particular the processing of personal data is fair and lawful and necessary for both MoJ and PHE to perform its functions (schedule 2, paragraph 5). For the same reason it is necessary to process sensitive personal data (schedule 3, paragraph 7).
- 9.2 PHE agree to process any Personal Data in the Shared Information in accordance with the requirements of this Agreement, and in particular PHE agree that they shall:
- (a) process the Personal Data only as set out in this Agreement;
 - (b) process the Personal Data only to the extent, and in such manner, as is necessary for the Project;
 - (c) comply with obligations of the seventh data protection principle in the Act and in particular implement appropriate technical and organisational measures to protect the Personal Data against unauthorised or unlawful processing and against accidental loss, destruction, damage, alteration or disclosure. These measures shall ensure a level of security appropriate to the harm which might result from any unauthorised or unlawful Processing, accidental loss, destruction or damage to the Personal Data and having regard to the nature of the Personal Data which is to be protected.
 - (d) take reasonable steps to ensure the reliability of any personnel who have access to the Personal Data. In PHE such personnel will be a limited number of analysts who are trying to identify relationships between alcohol treatment and offending to develop more effective policies. Access to "Dataset D" will be saved in restricted

folders, which only a limited number of analysts, who will be cleared to levels in line with organisations' vetting protocols.

(e) ensure that all Personnel required to process the Personal Data are informed of their obligations under this Agreement under the Statistics Code of Practice and Civil Service Code of Conduct with regard to the security and protection of Personal Data and that those obligations are complied with;

(f) ensure that no Personnel publish, disclose or divulge any of the Personal Data to any third party unless directed in writing to do so by all other parties;

(g) notify the other parties within five working days if they receive a complaint or request relating to the parties' obligations under the Data Protection Legislation;

(h) provide the other parties with full co-operation and assistance in relation to any complaint or request made in relation to this data sharing, including by:

(i) providing the other parties with full details of the complaint or request;

(j) complying with a data access request within the relevant timescales set out in the Data Protection Legislation and in accordance with the other parties' instructions.

(k) permit either Party (subject to reasonable and appropriate confidentiality undertakings), to review the Personal Data Processing activities (and/or those of its agents, subsidiaries and sub-contractors) and comply with all reasonable requests or directions to enable any party to verify that each party is in full compliance with its obligations under this Agreement; and

(m) not process Personal Data outside the European Economic Area.

9.3 MoJ and PHE shall comply at all times with the Data Protection Legislation and shall not perform its obligations under this Agreement in such a way as to cause any of the parties to breach any of its applicable obligations under the Data Protection Legislation and any other applicable law, in particular the Human Rights Act 1998 and the common law of confidentiality.

10. SECURITY OF SHARED INFORMATION

10.1 In addition to the requirements in Clause 9 in respect of Personal Data, MoJ and PHE agree to process all the Shared Information (Datasets A, C and D) in accordance with the following security requirement:

- (b) the confidentiality of the Shared Information will be preserved in outputs and publications, as detailed in Clauses 8 and 9;
- (c) Any publications resulting from this DSA will be reviewed by both parties in advance of publication as agreed in the terms of the Working Group;
- (d) Shared Information will only be available to named individuals from PHE with approved access to the PHE secure network;
- (f) In PHE, data will be stored on a secure server, housed in a secure room in Skipton House. Only members of the Evidence Application Team have access to the secure network (where sensitive NDTMS data is currently

housed), and only members of IT have access to the server. Access to the Shared Information will be restricted to named individuals from PHE and the study contractor as outlined in 4.4. An analyst can only access a database once they have an approved Business Case. Access will only be approved if the applicant has a legal and justified reason;

- (g) Shared Information will not be accessed at a location outside the European Economic Area.

10.2 The transfer of the Shared Information will take place as follows:

- (a) Dataset A will be transferred securely in line with the assessed impact level of the data using an encrypted removable media. This will be collected in person from MoJ (Petty France) by a nominated member of PHE staff.
- (b) When the data is received and downloaded, Shared Information should be opened and saved onto the Data Recipient's secure system immediately. The removable media will be returned in person to MoJ by a nominated PHE staff member. Data will be deleted securely from the removable device by MoJ. MoJ will inform PHE that this has been completed within one day of receipt of the media. It is the Data Recipient's responsibility to inform the other party, within one week of receiving Dataset A, if they are unable to access this Shared Information.
- (b) The Shared Information will be stored on a secure server in PHE with password protected access to a limited and designated number of analysts. The datasets will be destroyed by PHE within the timeframes outlined in this agreement under the project description (6.6, 6.7, 6.9).
- (c) MoJ's Chief Statistician will ensure that MoJ's data transfer protocols are followed.
- (e) PHE's Head of Analysis will ensure that PHE's data transfer protocols are followed (or in the event this specific role changed, its successor)

10.3 MoJ and PHE guarantee that the Shared Information will be transferred in accordance with the Security Policy Framework.

11. INTEGRITY OF SHARED INFORMATION

- 11.1 MoJ and PHE shall not delete or remove any proprietary notices contained within or relating to the Shared Information.
- 11.2 The MoJ and PHE shall take responsibility for preserving the integrity of the Shared Information and preventing the corruption or loss of the Shared Information.

12. FREEDOM OF INFORMATION

- 12.1 The Parties are all subject to the provisions of FoIA and the Environmental Information Regulations and shall assist and co-operate with each other to enable each other to comply with their respective statutory duties in relation to Requests for Information. In particular, where a Party receives a Request for Information pertaining to the subject matter or operation of this Agreement, it shall as soon as practicable notify the other Party's nominated representative, in writing, of the details of the

information requested, the date such Request was made and, if permitted by law, the name of the person making the Request. The Party which has received the Request shall, prior to responding to the applicant, consult with the other Party and to facilitate such consultation shall provide it with a copy of all information which it proposes to disclose not less than 5 working days before disclosure.

13. PRODUCTS AND PUBLICATIONS

- 13.1 The Shared Information may theoretically allow for persons to be identified, although the risk of this happening will be minimised by the steps taken in clause 9. MoJ and PHE, therefore, agree that no outputs will be produced which could lead to identification of a person by a third party.

14. DISCLOSURE PROTECTION

- 14.1 Techniques for aggregation and disclosure protection, as part of any analysis of the shared data, will be in accordance with the rules set out below.

- (a) Tables that contain very small sample numbers in some cells may be disclosive. MoJ and PHE will ensure that tables do not report numbers or percentages in cells based on only 5 or fewer cases. Cells based on 5 or fewer cases should be combined with other cells or, where this is not appropriate, reported as 0 percent.
- (b) Tabular outputs should not report analyses at personally disclosive levels of geography.
- (c) Although most outputs from models or other statistical analysis will not be disclosive, MoJ and PHE will ensure that persons, households or organisations cannot be identified. In particular, results based on very small numbers, should be avoided. Any output that refers to unit records, e.g. a maximum or minimum value, should be avoided. Models should not report actual values for residuals.
- (d) Graphical outputs should be based on non-disclosive information. MoJ and PHE will take particular care not to report extreme outliers.

15. RETENTION OF DATA

- 15.1 The Shared Information will include data on a cohort of offenders who left prison in 2013-14 and have been cautioned or convicted from 1st January 2000 to the 31st March 2015, as outlined in Annex A.
- 15.2 PHE will destroy Dataset A immediately after Dataset C has been created and tested and Dataset C will be destroyed after Dataset D has been created and tested. Both A and C will be destroyed no later than three months after the receipt of Dataset A.
- 15.3 In accordance with section 33 of the DPA and subject to paragraph 15.4 below, the anonymised Dataset D will be retained for a maximum of three years by PHE. Annex A sets out the justification for why offending data from 2000 onwards is required on offenders who left custody in 2013-14.
- 15.4 The retention period for Dataset D will be reviewed annually, or more regularly if appropriate, to ensure the data is not kept longer than it needs to be.

16. ACTIONS AT END OF THE DATA RETENTION PERIOD

- 16.1 At the end of the data retention period, or upon termination of the agreement if earlier, MoJ and PHE agree to destroy all copies of the Shared Information. Deletion in PHE will be in line with PHE deletion practices - the versions that are accessible by analysts will be deleted but some backups will remain which will be over-written in time. MoJ will delete data in line with MoJ deletion practices.
- 16.2 After the Shared Information has been destroyed, MoJ and PHE will sign a declaration to confirm that the Shared Information has been destroyed. For PHE this will be confirmed by the Head of Analysis (or in the event this specific role changed, its successor), and at MoJ this will be confirmed by MoJ's Chief Statistician.

17. LOSS AND UNAUTHORISED RELEASE

- 17.1 The MoJ and PHE will report to all parties any loss or unauthorised release of the Shared Information, as soon as possible, or no later than 24 hours after the loss or unauthorised release is discovered.
- 17.2 MoJ and PHE acknowledge that any loss or unauthorised release of the Shared Information can be treated as valid grounds for terminating this agreement by any party.
- 17.3 Any loss or unauthorised release of the Shared Information by MoJ or PHE will need to be investigated jointly by all parties. Existing departmental data incident processes and reporting will be utilised.

18. TERMINATION

- 18.1 Any Party may terminate this Agreement upon one month's written notice to the other. In the event of the agreement being terminated the Shared Information will be destroyed no later than one month following receipt of the written notice.
- 18.2 Any Party may terminate this Agreement with immediate effect in the event of breach of its obligations by any other Party to this Agreement.
- 18.3 Any disputes arising concerning this Agreement will be resolved initially by discussions between MoJ and PHE.

19. STATUTORY COMPLIANCE

- 19.1 The Parties shall comply with all relevant legislation, regulations, orders, statutory instruments and any amendments or re-enactments thereof, and including section 123 of the Social Security Administration Act 1992 from the commencement of this agreement.

20. STATUS

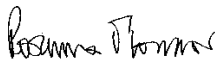
- 20.1 This Agreement is not intended to be legally binding, and no legal obligations or legal rights shall arise between the parties from this Agreement. The Parties enter into this Agreement intending to honour all their obligations.
- 20.2 Nothing in this Agreement is intended to, or shall be deemed to, establish any partnership or joint venture between the Parties, constitute either Party as the agent of the other Party, nor authorise either of the Parties to make or enter into any commitments for or on behalf of the other Party.

AS WITNESS of which the parties have set their hands on the day and year first above written

SIGNED for and on behalf of
THE SECRETARY OF STATE FOR JUSTICE
By:

Name: Steve Ellerd-Elliott
Title: Chief Statistician

SIGNED for and on behalf of
THE SECRETARY OF STATE FOR HEALTH acting through its executive agency
Public Health England
By:



Name: Rosanna O'Connor
Title: Director of Alcohol, Drugs and Tobacco

21. Version History

VERSION	DATE	SUMMARY OF CHANGES	CHANGES MARKED
0.1	21 December 2017	First draft shared with Data Linking Team (MoJ)	
0.2	10 January 2017	DLT (MoJ) comments on the first draft shared with PHE	
0.3	8 February 2017	Revised draft shared with DLT (MoJ)	
0.3 MW	13 February 2017	DLT (MoJ) comments on revised draft	
0.4	17 March 2017	Revised draft incorporating comments on v0.3 and the revised data flow discussed with DLT (MoJ)	
0.5	24 April 2017	MoJ Legal and Data Assurance comments on v0.4	
0.6	26 April 2017	Revised draft following v0.5 comments from MoJ	
0.7	02 May 2017	Minor amendments	
1.0	26 May 2017	Final version – no additional changes to v0.7	

Key personnel	Name	Organisation (Team)
Author	Alisha Cooper Matt Walker	PHE MoJ (Data Linking Team)
Approvers	Steve Ellerd-Elliott Rosanna O'Connor	MoJ PHE
Review Control	Matt Walker and Sarah French Alisha Cooper	MoJ PHE

22. Document Control Personnel

23. Review dates

Version	Publication date	Review date
		Year from publication date

ANNEX A

JUSTIFICATION OF THE VOLUME OF DATA TO BE SHARED

It is the view of both MoJ and PHE that the volume of PNC data to be shared under this agreement (PNC data from 2000 onwards in England and Wales for people who were released from prison during 2013-2014) complies with the third Data Protection principle and Article 8 of the ECHR.

Longitudinal data is fundamental to this project as it will allow for a comparison group of similar offenders to be constructed, a key ambition of this study. By including historical PNC data it will be possible to define the offending characteristics of the treatment group. This will then enable a matched group of non-treated offenders to be identified for comparison of reconviction rates.

The data being processed is not excessive for the purposes set out in the DSA. Not all c80,000 individuals will be used in the final analysis but, as we do not know until after completing the propensity score matching (PSM) which individuals need to be excluded, the only way to derive a valid counterfactual group is to temporarily hold the data on all individuals, match in those who were in prison-based alcohol treatment, conduct the PSM and then permanently delete the unnecessary records. We believe this falls within the third principle of the DPA. Only named individuals working in the secure area at PHE would conduct the PSM and PHE would provide written confirmation that such records have been deleted as per the fifth principle of the DPA.

It was agreed by both parties that the most appropriate method would be for MoJ to send offender identifiers (Dataset A) for PHE to undertake the matching to NDTMS. This is because PHE's Confidentiality Toolkit does not permit identifiable activity information to be shared outside of PHE. Any potential change to the wording of this Toolkit, which is read out to those registering for treatment, may reduce take up in drug and alcohol treatment programmes.

ANNEX B

VARIABLE LIST AND JUSTIFICATION

As set out in section 5.3 these are the variables agreed for the data share.

An excel version of the variable list is available.

ANNEX C

Section 14.4 (c) of the Offender Management Act 2007. This provides the legal basis for this data sharing project:

Disclosure for offender management purposes:

(1) This section applies to—

- (a) the Secretary of State;
- (b) a provider of probation services (other than the Secretary of State);
- (c) an officer of a provider of probation services; and
- (d) a person carrying out activities in pursuance of arrangements made by a provider of probation services as mentioned in section 3(3)(c).

(2) In this section “listed person” means—

- (a) a government department;
- (b) a relevant local authority;
- (c) the Youth Justice Board for England and Wales;
- (d) the Parole Board for England and Wales;
- (e) a relevant contractor;
- (f) a chief officer of police;
- (g) a person who is responsible for securing the electronic monitoring of an individual; and
- (h) any other person specified or described in regulations made by the Secretary of State.

(3) Information may be disclosed—

- (a) by a person to whom this section applies—
 - (i) to another person to whom this section applies, or
 - (ii) to a listed person, or
- (b) by a listed person to a person to whom this section applies, but only if the disclosure is necessary or expedient for any of the purposes mentioned in subsection (4).

(4) Those purposes are—

- (a) the probation purposes;
- (b) the performance of functions relating to prisons or prisoners of—
 - (i) the Secretary of State;
 - (ii) any other person to whom this section applies; or
 - (iii) any listed person; and
- (c) any other purposes connected with the management of offenders (including the development or assessment of policies relating to matters connected with the management of offenders).

(5) In subsection (4)(b)—

- (a) the reference to prisons or prisoners includes a reference to—
 - (i) young offender institutions or persons detained in such institutions; and
 - (ii) secure training centres or persons detained in such centres;
- (b) the reference to functions, in relation to a listed person who is a relevant contractor, includes activities connected with the making or performance of a contract mentioned in subsection (9).

(6) Nothing in this section—

- (a) affects any power to disclose information that exists apart from this section; or
- (b) authorises the disclosure of any information in contravention of any provision contained in an enactment (whenever passed or made) which prevents disclosure of the information.

(7) But the Secretary of State may by order amend or repeal any provision mentioned in subsection (6)(b) which is contained in an enactment passed or made before the end of the Session in which this Act is passed so as to enable disclosures that would otherwise be permitted under this section.

(8) In this section “relevant local authority” means a county council in England, a Welsh county council or county borough council, a district council, a London borough council, the Common Council of the City of London or the Council of the Isles of Scilly.

(9) In this section “relevant contractor” means—

(a) a person who has entered into a contract for the running of, or of part of—

(i) a prison or young offender institution under section 84 of the Criminal Justice Act 1991 (c. 53);

(ii) a secure training centre under section 7 of the Criminal Justice and Public Order Act 1994 (c. 33);

or a sub-contractor of such a person (within the meaning of the section in question);
or

(b) a person who has entered into a contract with the Secretary of State—

(i) under section 80 of the Criminal Justice Act 1991 for the purposes of prisoner escort arrangements (see subsection (2) of that section); or

(ii) under paragraph 1 of Schedule 1 to the Criminal Justice and Public Order Act 1994 for the purposes of escort arrangements for offenders detained at secure training centres (see paragraph 1(3) of that Schedule).

(10) In this section “enactment” includes any subordinate legislation (within the meaning of the Interpretation Act 1978 (c. 30)).

APPENDIX IV: ETHICS APPROVAL LETTER



Health & Social Care REC

The Burroughs
Hendon
London NW4 4BT

Main Switchboard: 0208 411 5000

27/03/2017

APPLICATION NUMBER: 1555

Dear Arun Charles Sondhi

Re your application title: Prison Alcohol Treatment Re-conviction : A Data Linkage Study

Supervisor: Betsy Thom

Thank you for submitting your application. I can confirm that your application has been given approval from the date of this letter by the Health & Social Care REC.

Please ensure that you contact the ethics committee if any changes are made to the research project which could affect your ethics approval.

The committee would be pleased to receive a copy of the summary of your research study when completed.

Please quote the application number in any correspondence.

Good luck with your research.

Yours sincerely

Chair Dr Gordon Weller

Health & Social Care REC