

Research paper

Effect of initiating drug treatment on the risk of drug-related poisoning death and acquisitive crime among offending heroin users



Matthias Pierce^{a,*}, Sheila M. Bird^b, Matthew Hickman^c, John Marsden^d, Graham Dunn^a, Toby Seddon^e, Tim Millar^a

^a School of Health Sciences, Faculty of Biology, Medicine and Health, University of Manchester, UK

^b MRC Biostatistics Unit at University of Cambridge School of Clinical Medicine, Cambridge, UK

^c School of Social and Community Medicine, University of Bristol, UK

^d Addictions Department, Institute of Psychiatry, Psychology and Neuroscience, King's College London, UK

^e School of Law, University of Manchester, UK

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ABSTRACT

Background: A recent Cochrane review of randomised trials identified a lack of evidence for interventions provided to drug-using offenders. We use routine data to address whether contact with treatment services reduces heroin users' likelihood of a future acquisitive offence or drug-related poisoning (DRP) death.

Methods: Heroin-users were identified from probation assessments and linked to drug-treatment, mortality and offending records. The study cohort was selected to ensure that the subject was not: in prison, in treatment or had recently left treatment. Subjects were classed as initiators if they attended a triage appointment within two weeks of their assessment; non-initiators otherwise. Initiator and non-initiators were compared over a maximum of one year, with respect to their risk of recorded acquisitive offence or DRP-death. Balance was sought using propensity score matching and missing data were accounted for using multiple imputation.

Results: Nine percent of assessments identified for analysis were classed as initiators. Accounting for observed confounding and missing data, there was a reduction in DRPs associated with initiator assessments, however there was uncertainty around this estimate such that a null-effect could not be ruled out (HR: 0.42, 95% CI 0.17–1.04). There was no evidence of a decrease in the recidivism risk, in fact the analysis showed a small increase (HR: 1.10, 95% CI 1.02–1.18).

Conclusion: For heroin-using offenders, initial contact with treatment services does not appear to reduce the likelihood of a future acquisitive offence.

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Introduction

Endemic heroin use is associated with significant public health and social problems (UN Office On Drugs and Crime, 2010): in particular, high rates of mortality (Degenhardt et al., 2013; Pierce, Bird, Hickman, & Millar, 2015) and acquisitive offending (Bennett, Holloway, & Farrington, 2008; Pierce, Hayhurst et al., 2015). In the UK, structured addiction treatment is commissioned with the aim of reducing users' dependence on illicit drugs and minimizing the harms associated with these drugs, including premature death and offending (Home Office, 2010). The front-line intervention offered

for heroin dependence is opioid substitution therapy (OST) with methadone or buprenorphine (National Treatment Agency for Substance Misuse, 2006). Psychological support is also available but recommended only as an adjunct to OST (National Treatment Agency for Substance Misuse, 2006). In the UK, the treatment pathway for patients with heroin dependence is determined during a triage appointment with a drugs key-worker (National Treatment Agency for Substance Misuse, 2006).

In medical and social research, randomised controlled trials (RCT's) are considered optimal for assessing the effectiveness of an intervention (Campbell, Stanley, & Gage, 1966). However, RCTs and meta-analysis of interventions provided for heroin users have been underpowered to detect changes in mortality or offending and usually focus on intermediate outcomes such as reduced illicit opioid use and treatment retention (Amato et al., 2013; Amato, Minozzi, Davoli, & Vecchi, 2011a; Amato, Minozzi, Davoli, & Vecchi,

* Corresponding author at: Centre for Biostatistics, Faculty of Biology, Medicine and Health, University of Manchester, 1st Floor, Jean McFarlane Building, Oxford Road, M13 9PL, UK.

E-mail address: matthias.pierce@manchester.ac.uk (M. Pierce).

2011b; Mattick, Breen, Kimber, & Davoli, 2009; Mattick, Breen, Kimber, & Davoli, 2014). For example, a recent meta-analysis of RCTs for OST offered for heroin-using offenders was unable to detect an effect on future arrests (1 study, 62 subjects, RR: 0.60, 95% CI: 0.32–1.14) or incarceration (3 studies, 472 subjects, RR: 0.77, 95% CI: 0.36–1.64) (Perry et al., 2015).

Cohorts identified from routinely collected data can provide the necessary power to investigate rarer outcomes (Bird, 2008). Many studies of addiction treatment aim to quantify the effect of being treated by contrasting periods in and out of treatment. However, this will be a biased comparison if there are non-random reasons for why patients leave treatment which are related to the outcome under consideration. To account for this confounding bias, confounding variables should be measured over follow-up; however, such information is rarely available or incomplete. This problem can be avoided by analysing subjects according to initial treatment status – something closer to the intention to treat principle routinely used in randomised controlled trials. Treatment and control subjects can then be balanced prior to follow-up, using propensity score methods.

This study used a large, observational, record-linkage dataset from England, to analyse the effect of initiating drug-treatment on subsequent offending and mortality. We focus on the effect of initiating treatment, ignoring the fact that many who begin treatment may drop-out early. Therefore, our study aims to quantify the impact of a policy where everybody with heroin dependence attends a triage appointment. The study is designed to best emulate what would have occurred during an RCT – an approach that has been recommended in pioneering work from other areas of clinical research (Danaei, Rodriguez, Cantero, Logan, & Hernan, 2013; Hernan et al., 2008; Toh & Manson, 2013).

We use this design to investigate two hypotheses: for heroin users identified in the criminal justice system, does initiating contact with treatment services reduce the risk of: (a) a future drug-related poisoning death and (b) a recorded acquisitive offence.

Methods

A cohort of heroin users was identified from probation (offender management) assessments, using inclusion and exclusion criteria. Following an eligible probation assessment, if subjects were recorded in treatment data as attending a triage appointment within two weeks they were classed as an *initiator*; otherwise they were classed as a *non-initiator*. Outcome events were defined as a drug-related poisoning (DRP) death or a day when the subject committed a recorded acquisitive offence over a maximum of one-year. Time-to-outcome was compared between initiators and non-initiators, irrespective of future treatment status. Balance between initiators and non-initiators was sought by matching on propensity scores calculated using an extensive set of baseline covariates available from probation assessment and historical offending records.

Datasets

Data were extracted from the Drug Data Warehouse – a collection of case-linked national datasets on substance users in England, covering the period 1st April 2005 to 31st March 2009 (Millar et al., 2012).

The analysis cohort was identified from probation assessments recorded on the Offender Assessment System (OASys) database. OASys contains information from a structured interview between offender and probation officer with the aim of assessing an offender's recidivism risk and to identify particular needs (National Probation Services, 2003). This assessment can form part of a pre-

sentence report, to aid the judge's sentencing decision, or can be used to help probation services manage offenders post-sentence, for example after release from prison on licence (i.e. serving the remainder of a sentence in the community, under regular supervision by probation services).

Treatment data were obtained from the National Drug Treatment Monitoring System (NDTMS). NDTMS collects data on contact between substance-use disorder patients and structured treatment delivered by National Health Service and third-sector providers, which together account for almost all such provision in England. When a substance-use disorder patient initially contacts treatment services they undergo a triage appointment with a key-worker. The aim of this appointment is to assess the patient's needs and determine the most appropriate treatment. After this appointment, clients may be offered treatment within the assessing treatment agency, or onward referral to another service.

Details of sanctioned offending were determined through Police National Computer (PNC) records, for all offences that occurred since the age of ten, and resulted in a conviction, caution, warning or reprimand. A death occurring over follow-up was established from national mortality records.

Linkage was done based on a minimal identifier (initials, date of birth and gender). Additionally, criminal-justice system databases included an individually unique CJS identifier. Due to data release requirements, instances where more than one CJS identifier linked to a single minimal identifier were removed because this provided evidence that multiple subjects shared the latter details. This affected 33.6% of assessments in OASys and these were dropped from the analysis. Identifiers were fully anonymised prior to their release to the study team.

Inclusion/exclusion criteria

Probation records were included in the analysis cohort provided the interviewed subject: was assessed between April 1 2005 and March 1 2009; reported weekly or more frequent use of heroin (by any route of administration); was aged 18–64 years. After resulted in 117,044 assessments (see Fig. 1).

A priori criteria were established so that, in turn, probation records were excluded from the study if:

- (i) The assessment was for a pre-sentence report which was associated with a subsequent prison sentence ($n = 22,097$)

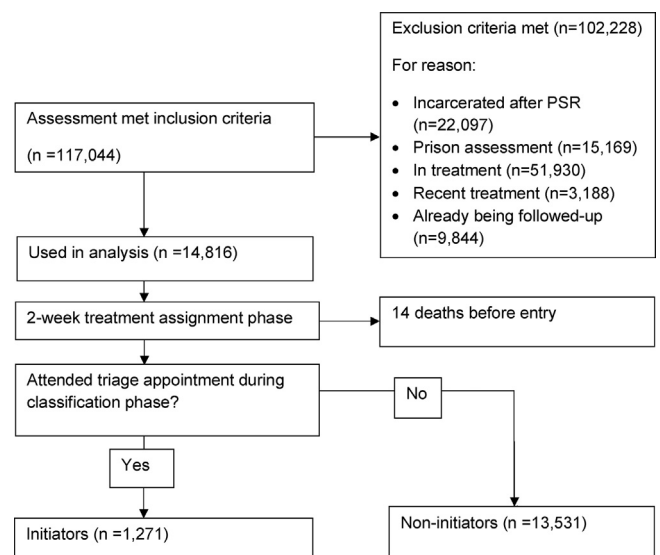


Fig. 1. Flow-chart of selection of probation assessments into the analysis cohort.

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