"Exposure to treatment reduces recorded convictions and therefore offending… the greater the successful engagement in treatment, the greater the reduction…"

THE IMPACT OF DRUG TREATMENT ON RECONVICTION

NHS

National Treatment Agency
for Substance Misuse

CONTENTS

ABSTRACT

This study compares the differences in the conviction rates of known offenders during the two years before their initial assessment for drug treatment and the two years after.

It presents the results of an analysis of data from the National Drug Treatment Monitoring System and conviction records from the Police National Computer. The data is drawn from a cohort of people who started a new course of drug treatment in 2006-07 and who had at least one conviction during the two years prior to their start date. The study was limited to trigger offences[a] and soliciting (i.e. prostitution).

- The individuals retained in treatment for the entire two-years (4,677) showed an average 47% reduction in convictions
- Those who completed treatment successfully after being retained in treatment for six months or more showed virtually the same average reduction (48%) as those retained in treatment for the full two years
- Those retained for the full period reduced their convictions by three times more than those who dropped out of treatment, who achieved just 15%
- For all those who both completed treatment successfully and did not return during the period, the observed reduction in convictions is 61%.

While these figures cannot be interpreted as direct, quantifiable measures of a causal effect of drug treatment, the results suggest that exposure to treatment reduces recorded convictions and therefore offending, as the greater the successful engagement in treatment, the greater the observed reduction. This is most noticeable in opiate and/or crack cocaine users, who make up the majority of the cohort.

By focusing on engaging clients and promoting successful completions, drug treatment can help to maximise reductions in offending by individuals receiving help for their addiction, particularly if they use opiates and/or crack cocaine.

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[a] as defined by the Criminal Justice and Court Services Act 2000: http://www.legislation.gov.uk/ukpga/2000/43/schedule/6

INTRODUCTION

Around 200,000 adults get help for drug dependency in England every year. Most are addicted to heroin or crack cocaine, or both, and many commit high-volume acquisitive crime to fund their addiction[1]. The National Drug Treatment Monitoring System (NDTMS) database was set up in 2004 to record and monitor details of individuals going through the treatment system and the types of treatment received. A new government initiative has enabled NDTMS information to be observed alongside criminal conviction data for the first time.

This paper presents the results of a study using data derived from the Drugs Data Warehouse (DDW). The DDW has been developed by the Home Office, in conjunction with other government departments and the National Drug Evidence Centre (NDEC) at the University of Manchester, to facilitate access to record-linked data gathered from administrative systems within health and criminal justice in England. It anonymously links several different available administrative records that relate to the same individual, describing those individuals' recorded contacts with drug treatment and the criminal justice system. For more information on the methods used to construct the DDW, please see the published report on its construction.[2]

This study presents analysis of an extract from the DDW provided to the NTA. The extract consists solely of information from the NDTMS and conviction records from the Police National Computer (PNC). The analysis concentrates on the patterns of convictions observed before and after assessment for drug treatment, for adults who started treatment during the financial year 2006-07.

The current drug strategy[3] makes clear its goal that treatment enables people to overcome dependence and achieve sustainable recovery from addiction. To deliver this treatment services should be focused on the following outcomes:

- freedom from dependence on drugs or alcohol
- prevention of drug-related deaths and blood-borne viruses
- a reduction in crime and re-offending
- sustained employment
- the ability to access and sustain suitable accommodation
- improvement in mental and physical health and wellbeing
- improved relationships with family members, partners and friends
- the capacity to be an effective and caring parent.

This piece of work contributes to the evidence base around how treatment can continue to deliver a reduction in the offending behaviour of drug users.

APPROACH

The study assesses levels of reconviction in those individuals who are known offenders prior to starting treatment; the analysis presented, therefore, focuses on individuals who had at least one recorded conviction during the two years prior to treatment. The aim is to demonstrate the observed differences between the recorded conviction rates in the two years prior to starting treatment when compared with the two years after, for the whole cohort of known offenders and sub-groups within it. The study further investigates the validity of these observed differences with reference to the study design and selection criteria employed.

The number of adults starting treatment in 2006-07 from which the final cohort for analysis was selected was 53,851. Of these, the majority (34,281) had no PNC record during the two-year pre-treatment period, leaving 19,570 who had one or more convictions during the same period. This study, therefore, focuses on these 19,570 known offenders who received a broad

range of different treatments, for differing lengths of time at a variety of statutory and non-statutory treatment providers.

It is worth noting that where no convictions are observed, it does not necessarily follow that there is an absence of offending. As the PNC data in the analysis covers only those reported offences that result in a conviction, it is entirely possible that, either before or after starting treatment, individuals were offending but were not caught.

Additionally, the opportunity or drive to offend is not necessarily consistent throughout the observed periods. Some individuals may have served a custodial sentence[b], have been on probation or under an electronic tagging regime at any point during the four-year period observed. Unfortunately, the information available to this study was not sufficient to assess imprisonment during those four years[c]. It is also plausible that some could have been in a period of recovery returning to offending (and possibly also treatment) at the onset of relapse. There is also the possibility that some of those included may have died during the period studied. NDTMS shows that 85 people passed away while in contact with treatment but it is possible others may have done so while not in contact, i.e. post-discharge.

While it is not possible to know the full extent of individual offending behaviour from the available PNC data, the conviction information in this report is not subject to the potential inaccuracies of self-report information from small-sample questionnaires and represents an accurate record of proven offending for each individual.

Although 'before' and 'after' measurements are arranged around the date of initial assessment for treatment, this study does not attempt to assert categorically that observed differences occur solely as a result of drug treatment. There are methodological challenges in assessing the effects of drug treatment interventions on individual offending, not least of which is an inability to establish a counterfactual scenario, i.e. what would have happened had the intervention not been applied. There will be other factors prevalent in changes in individual offending (either increased or reduced) which lie outside of the influence of either the treatment intervention or the Criminal Justice System (CJS), which it is not possible to quantify with this data. Nevertheless, given the difficulty in establishing the counterfactual scenario, this study represents the best currently available insight into the relationship between drug treatment and proven reoffending.

All figures in this report are presented having been adjusted for the statistical phenomenon of regression toward the mean. This was necessary due to the selection criteria employed for individuals to be included in the study. Put simply, selecting individuals on the basis of having a recorded conviction prior to treatment artificially inflates the average number of convictions observed in the pre-treatment period and therefore also inflates the difference observed between the pre and post figures. A detailed explanation and full details of the adjustment can be found in Appendix B.

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[b] Any serving a custodial sentence in the period post assessment would be recorded as being discharged in NDTMS.
[c] While PNC data in the extract did include sentencing information, no further detail was available on the date on which it began or ended. It was not possible to know, for example, the date on which a 12 month custodial sentence began, how much time already served counted against it or how much of the sentence was eventually served.

Offences included

The PNC information includes details of all convictions, from the most minor to the most serious. As the report is primarily concerned with people seeking treatment for drug dependency, it is logical to concentrate on those offences that may be considered most closely associated with this pattern of behaviour; the estimated cost of drug related crime in England and Wales is £13.9bn[4] (although this study focuses on England only).

While there is no universally accepted definition of these offences, Schedule 6 of the Criminal Justice and Court Services Act 2000 (http://www.legislation.gov.uk/ukpga/2000/43/schedule/6) identifies a number of sections of UK legislation, offences under which are considered 'trigger offences' for drug testing on arrest in England and Wales. These offences are largely acquisitive i.e. committed in the pursuit of material gain (personal possession of a controlled drug being the only one which is not) and are thought to be closely associated with the drive to fund drug purchases in those dependent on drugs.

Offending behaviour detailed in this report is limited to these trigger offences, with one addition: soliciting (i.e. prostitution). It is reasonable to assume that, when committed by those identified as seeking treatment for drug dependency, a significant proportion of soliciting offences occur in order for the individuals to fund their addiction.[5,6]

The available PNC information includes details of all charges, whether resulting in a conviction or not. This report considers only those instances where there is a recorded conviction, official caution, warning or reprimand, signifying proven offending. A small amount of cases pending a verdict at the time of the data extract were also included (475, 0.4%) in order not to positively bias 'after' observations (cases where the verdict is pending tended to have occurred towards the end of the four-year time period observed, i.e. nearer to the point the data was extracted).

Also, since the latest available conviction data in the DDW goes up to the end of March 2009, the maximum period observable after the latest possible treatment start (31 March 2007) is two years (731 days). This maximum period has, therefore, been applied to each person included in the study. It follows, then, that the period observed prior to initial assessment for treatment is of the same length to provide an equal comparison. Any convictions that occurred outside of these time limits were removed from the analysis. The date considered for each conviction is the date on which the offence occurred rather than the date of conviction. Each table, therefore, contains details of convictions in the two years before the date of starting treatment and the two years after this date for those individuals selected.

It is likely, in many instances, that offending behaviour predates drug misuse[7]; they are both aspects of delinquent behaviour. There is no evidence to support an assumption that stopping drug use would lead to a complete cessation of offending in all cases. A more reasonable assumption might be that it would remove the drive to commit those offences which were directly related to funding the individual's addiction but that a level of residual criminality may still remain. Future analysis of the DDW might assess how many individuals' offending predates their drug misuse.

ANALYSIS

Summary of key findings

- The individuals included in the analysis who are retained in treatment for the entire two-year period observed (4,677) show an average 47% reduction in convictions
- Those who completed treatment successfully after being retained in treatment for six months or more show virtually the same average reduction (48%) as those retained in treatment for the full two-year period
- Those who are retained for the full period reduce convictions by more than three times that observed in those who drop out of treatment (15%)
- 41% of all 19,570 individuals in the study show no convictions in the two-year period following initial assessment for treatment
- For all those who both completed treatment successfully and did not return during the period, the observed reduction in convictions is 61%.
- Users of opiates and/or crack cocaine are twice as likely to have one or more convictions pre-treatment than those who use other drugs and they also have a 50% higher average number of convictions per user
- Whether individuals are referred into treatment via the CJS, or present of their own accord or via any other route, appears to make little difference to reductions in convictions.

Detailed analysis

Table 1. Mean conviction rates

n	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
19,570	3.47	2.58	26%

Table 1 shows the mean conviction levels in both periods of all individuals included in the analysis. On average there are 26% fewer convictions in the two-year period following treatment start compared with the equivalent period immediately prior.

Table 2. Numbers of convictions by offence type (for the 19,570 individuals included)[d]

Offence category	No. convictions pre treatment start	No. convictions post treatment start	Difference	% Difference
Theft[e]	45,265	34,319	10,946	24%
Drug offences	8,856	5,045	3,811	43%
Burglary (non-domestic)	3,139	2,244	895	29%
Fraud and forgery	3,099	1,336	1,763	57%
Burglary (domestic)	2,996	2,109	887	30%
Theft of a vehicle	1,269	590	679	54%
Vagrancy	970	710	260	27%
Soliciting	906	367	539	59%
Going equipped for stealing	869	654	215	25%
Robbery	571	523	48	8%
Totals	67,940	47,897	20,043	

[d] Although figures throughout the report are adjusted, the adjustment took place after the numbers of offences had been aggregated together. It was not possible to adjust figures for this table as they could not be disaggregated to individual categories, therefore, figures in this table only are unadjusted.
[e] Includes 'Handling Stolen Goods'

Table 2 offers a breakdown of these convictions by category. Theft offences represent two thirds of the total. All of the categories show a reduction, with most showing a similar reduction to the overall figure. Particularly worthy of note are the significant reductions in the fraud, vehicle theft and soliciting categories.

Table 3. Mean conviction rates by opiate/crack use (OCU)

Opiate/crack use	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
OCU	17,283	3.61	2.77	23%
Non OCU	2,287	2.41	1.18	51%

Table 3 shows the same information as Table 1, with those using opiates and/or crack cocaine on entering treatment grouped together separately from those who use all other types of drug.

Users of opiates and/or crack cocaine make up a greater proportion of those identified as offenders in the period before treatment (88%) than of the total cohort population (78%). Previous research identifies a strong link between use of these drugs and acquisitive crime[1,3] and these findings appear to be consistent with this thinking. Proportionally, 41% of the opiate and/or crack users in the cohort are convicted of an offence in the period before treatment versus 19% of users of all other drugs.

Opiate and/or crack users appear to be more frequent offenders in this cohort, with their mean number of convictions before treatment 50% greater per individual than that of those who use other drugs. It also follows that these, more entrenched, users of the more addictive drugs appear to reduce their convictions by a smaller proportion, less than half that of those who don't use opiates or crack. Table 4 presents the analysis by individual drug group.

Table 4. Mean conviction rates by presenting drug

Presenting drug	n=19,570	Mean convictions pre treatment start[f]	Mean convictions post treatment start	% Reduction
Opiates only	8,517	3.44	2.58	25%
Crack only	1,025	2.93	1.79	39%
Opiates & Crack	7,741	3.89	3.11	20%
Cocaine	941	2.17	1.04	52%
Cannabis	684	2.28	1.01	56%
Other drugs	662	2.89	1.55	47%

Table 4 shows that, within this opiate and/or crack using group, the majority of individuals are opiate (predominantly heroin) users, either in isolation or in combination with crack. It also reveals that these individuals have the highest levels of convictions and the least amount of difference between the two periods studied. However, those who use only crack cocaine show a significantly greater level of reduction than opiate users. The reduction in convictions for users of other drugs does not differ greatly between individual drug groups.

These findings are consistent with previously published analysis of drug treatment outcomes. Users of opiates and/or crack cocaine were found to have far higher rates of re-presentation to treatment and the Criminal Justice System, particularly those who use both substances[8]. Opiate and crack cocaine users were also found to reduce their drug use by significantly less than users

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[f] Please note that due to rounding, actual means are not exactly equal to the numbers displayed. For example, in Table 4 above for 'Other Drugs' (2.89-1.55)/2.89=0.46, whereas (2.894-1.546)/2.894=0.466 which is why the % reduction is displayed as 47%

of the same drugs in isolation during the first six months of treatment[9]. Similarly, significant numbers of users of powder cocaine were shown to either be abstinent (61%) or have significantly reduced their drug use (11%) in the six months following treatment start[10].

Table 5. Mean conviction rates by source of referral into treatment

Referral source	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
CJS	8,782	3.99	3.00	25%
Self	5,235	2.97	2.20	26%
Other	5,553	3.12	2.29	26%

There is a significantly larger proportion of referrals from the Criminal Justice System in the 19,570 pre-treatment offenders (45%) than in the 53,851 general treatment cohort (24%) and they appear to be more frequent offenders on average. This is to be expected given there is a direct route of referral into treatment following arrest for a trigger offence. It may be logical to expect that those referred into treatment as a result of sentencing or from the probation service would be less likely to reduce their offending than those seeking treatment independently or as the result of a clinical referral. It is interesting to note, therefore, that reduction in conviction rates between the two periods appears to have no association with the individual person's route into treatment, only the relative frequency of conviction events.

Table 6. Mean conviction rates by duration of treatment journey

Exited treatment after:	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
Less than 3 months	5,344	3.67	3.04	17%
3-6 months	3,465	3.49	2.78	21%
6-12 months	3,474	3.48	2.82	19%
1-2 years	2,610	3.46	2.62	24%
Still in treatment at 2 years	4,677	3.23	1.72	47%

Table 6 shows all individuals grouped by the amount of time the treatment journey considered here[9] lasted. The most significant reduction in convictions is made by the 4,677 who are retained in a continuous period of treatment for the whole two years (47%); this group is made up primarily of opiate users. The duration of the treatment journey is defined by the time between its start and end i.e. initial assessment date and final discharge date.

Table 6a. Mean conviction rates by duration of treatment journey and opiate/crack use

Opiate/crack use	Exited treatment after:	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
OCU	Less than 3 months	4,403	3.94	3.42	13%
	3-6 months	2,877	3.71	3.10	16%
	6-12 months	3,027	3.65	3.09	15%
	1-2 years	2,434	3.53	2.73	23%
	Still in treatment at 2 years	4,542	3.25	1.74	46%
Non OCU	Less than 3 months	941	2.38	1.29	46%
	3-6 months	588	2.43	1.19	51%
	6-12 months	447	2.35	0.97	59%
	1-2 years	176	2.43	1.11	54%
	Still in treatment at 2 years	135	2.72	1.09	60%

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[9] See Appendix A for more detail

The majority of those observed here are opiate and/or crack users, most of whom exit at some point during the two-year period. Those opiate and/or crack users who remain in treatment for the whole period see at least twice the reduction in convictions observed in any other OCU group.

As Table 6a demonstrates, the majority of those who don't use opiates or crack, as would be expected, exit treatment within 12 months. Users in treatment for problematic use of drugs other than opiates or crack tend to have more recovery capital (e.g. paid employment, settled accommodation and support networks) at the outset; dependence on these drugs tends to be of a less physical nature and the habits less entrenched. A significant reduction in convictions is observed after even a short time in treatment, perhaps suggesting that many of these individuals leave having gained what they needed from treatment.

Table 7. Mean conviction rates by treatment exit reason

Exit type	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
Still in treatment at 2 years	4,677	3.23	1.72	47%
Successful	3,159	2.98	1.76	41%
Dropped out	11,734	3.70	3.15	15%

Table 7 shows that, of those who leave treatment during the period, those who complete successfully reduce their convictions by almost three times as much, on average, as those who do not. Almost three quarters (73%) of convictions in the post-assessment period, were for those who dropped out. For all those who exit, either successfully or not, 70% of their post-assessment convictions occur after that exit.

Table 7a. Mean conviction rates by treatment exit reason and opiate/crack use

Opiate/crack use	Exit type	n=19,570	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
OCU	Still in treatment at 2 years	4,542	3.25	1.74	46%
	Successful	2,362	3.23	2.06	36%
	Dropped out	10,379	3.86	3.38	12%
Non OCU	Still in treatment at 2 years	135	2.72	1.09	60%
	Successful	797	2.23	0.87	61%
	Dropped out	1,355	2.49	1.37	45%

Table 7a gives the exit reasons split between users of opiates and/or crack and users of other drugs. The majority of opiate and/or crack users who exit during the two-year period drop out of treatment and see markedly less reduction in convictions, a third that of those who complete successfully and just over a quarter of the reduction observed in those who remain in treatment.

Of the opiate and/or crack users who don't drop out of treatment, a third complete successfully inside two years but most are retained in treatment for the entire period and see the greatest benefits. Although at first glance those who complete successfully appear to achieve less of a reduction, as is demonstrated later in this paper, those who complete treatment successfully after at least six months see a virtually identical reduction to those who are retained for the full period. The observed reduction for successful completions in this table is tempered by the lower reduction in those who do so before this six month point. Overcoming addiction can take several attempts: as presented in earlier research[8], a proportion of those

who complete successfully may relapse back into drug use, a possible explanation for the slightly lower figure observed.

Users of other drugs who are discharged during the post-assessment period are twice as likely as opiate and/or crack users to leave treatment successfully (37% vs. 18.5%). It is worthy of note that users of other drugs appear to make significant reductions in convictions even if they drop out of treatment, whereas this seems less to be the case for opiate and/or crack users.

During the first few months of treatment described above, many users of drugs other than opiates or crack cocaine will exit treatment having completed successfully and/or reduce their offending greatly. On the other hand, opiate and/or crack users who exit are much more likely to drop out having not completed their course of treatment, presumably continuing to use their drug(s) of dependency and continuing to offend. Greater time in treatment appears to have greater beneficial effects for opiate and/or crack users, particularly opiate users.
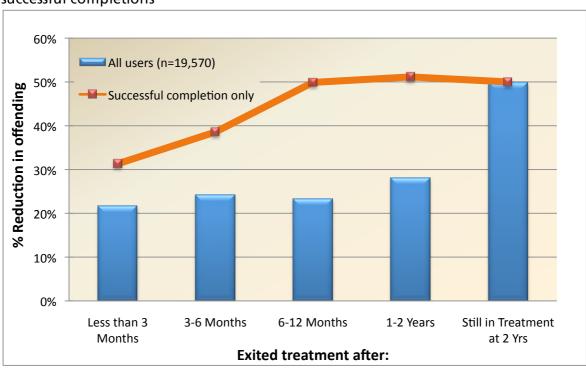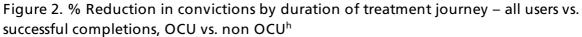
Figure 1. % Reduction in convictions by duration of treatment journey – all users vs. successful completions[h]

When time in treatment is observed in tandem with successful completions, it appears to have a much more linear relationship with the reduction in convictions. This is displayed in the orange line in Figure 1, above the bars representing the general reduction (from Table 6), and re-emphasises the seemingly beneficial, protective effects of both treatment retention and successful completion. Those with a successful completion who were also treated for six months or more show virtually the same level of reduction as those retained in treatment for the whole period.

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[h] Please note that the figure quoted for 'Still in Treatment at 2 Years' is the same figure in both instances as these clients did not exit treatment during the period studied. It is highly likely that those completing treatment successfully after this period of time will continue to show an upward trend in the successful completion line, which will eventually plateau, and is perhaps worth revisiting in future analysis.

Figure 2. % Reduction in convictions by duration of treatment journey – all users vs. successful completions, OCU vs. non OCU[h]
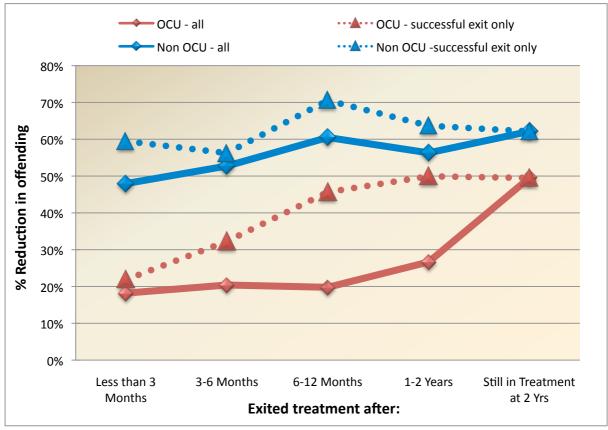

Figure 2 shows the same information as in Figure 1 split between opiate and/or crack users and users of other drugs. Users of opiates and/or crack show a greater reduction in convictions the longer they spend in continuous treatment when it ends with a successful completion. Again, virtually the same reduction is observed for those opiate and crack users who complete successfully after six to 12 months (45%) as for one to two years (47%) and for those retained for the full period (47%). This suggests a combination of retention in treatment (the duration dictated by clinical need) and a successful completion is the most beneficial scenario for these individuals.

For those who are not users of opiates or crack, the relationship is less divergent. Figure 2 suggests, along with earlier figures, that many of these individuals drop out having gained what they needed from treatment, although observed reductions in those who do have a successful completion are still slightly higher than the overall figures for this group.

Table 8. Re-presentations to treatment during the period

| Category | Re-presented to treatment during the study period | | | | | | | |
| | No | | | | Yes | | | |
	n	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction	n	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
All exits	6,211	3.01	1.70	43%	8,682	3.93	3.68	6%
OCU	4,554	3.31	2.02	39%	8,187	3.98	3.76	5%
Non OCU	1,657	2.17	0.85	61%	495	3.14	2.31	26%
Unplanned	4,393	3.12	1.97	37%	7,341	4.05	3.86	5%
Planned	1,818	2.75	1.07	61%	1,341	3.28	2.70	18%

Having left treatment many people will return[8]. There are many scenarios in which this may happen. Some may return to their drug use, others drop out of treatment early and return at a later date. This is a complex and large enough issue to justify its own study. However, of those who exit at some point during this study, it is possible to distinguish between those who started treatment again during the two years studied and those who remained out of the treatment system. In Table 8 we can see that of the 14,893 people who exited treatment, 8,682 returned to treatment during the study period, i.e. within two years of their original start date.

The remaining 6,211 had not returned to treatment by this point, whether they left successfully or dropped out and regardless of the duration of the original treatment journey. It should be noted that, because of the two-year limit to the study, those in treatment for longer periods prior to exit had a shorter window of opportunity in which to re-present to treatment following any potential return to drug use. Similarly, those who exited treatment early in the study period had a large window within which to re-present. It is also possible that some of those dropping out may have been imprisoned for all or part of the period following discharge, restricting their ability to commit offences. A small number may have died following exit from treatment.

Overall, those who exit but don't return reduce their convictions by 43% on average. While the majority (64%) of opiate and/or crack cocaine users who exit return to treatment at some point during the study period, among those who do not the observed reduction is 39%. Most users of other drugs (77%) who exit don't return. For all those who both completed treatment successfully and did not return during the period, the observed reduction in convictions is 61%.

Overall, for those who do return, the observed reduction is low. An interpretation could be that those who do not return are sustaining recovery during the period of the study; those who do return do so after having relapsed, using their drug(s) of dependency again, committing crime to fund their addiction and eventually returning to treatment as a result of either or both.

Retention in treatment

It is possible in the case of analysis presented earlier in this report that reductions in convictions will be attributable to a number of factors. It is likely that a proportion of the cohort will serve a custodial sentence at some point during the two-year period after starting treatment, for example[i]. To limit (but not eliminate) the influence of factors external to treatment, the best indicator we have is treatment retention. NDTMS data tells us that an individual in a continuous period of treatment almost certainly was not, for example, in prison or out of the country for a significant amount of time during the study period.

Looking at these individuals gives a greater picture of the protective benefit of treatment to those who need it. As seen earlier, virtually all (97%) of those who were retained for at least this length of time were opiate and/or crack users. The majority (66%) of opiate and/or crack users who didn't drop out of treatment during the period studied were retained in treatment for the full two-year period (as opposed to having a planned exit from the treatment system).

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[i] This is also applicable to the period before starting treatment and may have had a reducing effect on the pre-treatment mean

In the 2006-07 treatment population as a whole, the average treatment journey for all opiate and/or crack users (including all those starting before 1 April 2006) lasted 754 days[i]. Analysis of figures for those retained in treatment for the 731 day period, therefore, has particular relevance.

Almost all those who are retained in treatment for this length of time are opiate or opiate and crack users. As totals for other individual drug groups are small, the following tables display figures only for opiate or opiate and crack users. Figures for the smaller groups of users of other drugs can be found earlier in this study.

Table 9. Mean conviction rates – opiate/crack users retained for two years or more

n	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
4,456	3.25	1.75	46%

Table 10. Mean conviction rates by presenting drug – opiate/crack users retained for two years or more

Presenting drug	n=4,456	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
Opiates only	2,203	2.95	1.32	55%
Opiates & crack	2,253	3.55	2.17	39%

Tables 9 and 10 are versions of earlier tables reproduced for those opiate and/or crack users who are in continuous treatment for the two-year period observed post-assessment. Again, those who use both opiates and crack in conjunction appear to reduce their convictions by less than those who are solely users of opiates and their level of convictions is higher.

Table 11. Mean conviction rates by referral source – opiate/crack users retained for two years or more

Referral source	n=4,456	Mean convictions pre treatment start	Mean convictions post treatment start	% Reduction
CJS	1,650	3.96	2.19	45%
Self	1,363	2.74	1.56	43%
Other	1,443	2.93	1.43	51%

When considering these individuals' routes in to treatment, as observed earlier in this document, it appears to make little difference to the level of reduction in convictions. Those referred from criminal justice sources remain higher level offenders. A slightly smaller proportion of CJS referrals than the other two (22% vs. 30%) are retained in treatment for this length of time.

CONCLUSION

While it is not possible to take the results observed and presented in this paper as definitive reductions in offending uniquely attributable to exposure to treatment, they are nevertheless encouraging in their relativity to each other. Many of the established findings in earlier drug treatment studies appear to be supported.

For example, the longer spent in contact with treatment the greater the difference in reconviction rates. Sizeable reductions also occur when time in treatment is observed in

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[i] Those who were still in treatment at the end of the year were measured from the start of their journey up to 31 March 2007

conjunction with a successful completion. Longer time in treatment brings greater benefit. While this is broadly true for the whole group it appears more applicable to dependent users of opiates or opiates and crack cocaine, who represent the majority of people in treatment. Dependent users of other drugs are much less likely to have pre-treatment convictions but those who do appear to need less time to reap the most benefit and even seem to benefit significantly without leaving treatment successfully. In general, however, in the two-year period, reduction for those with a successful completion is twice that of those who drop out; those who complete successfully after six or more months in treatment appear to reap the same benefit as those retained in treatment for the whole period observed, as observed in the graphs in Figure 1 and Figure 2.

It is entirely possible that the various groups observed had very different characteristics from each other. Discharge from treatment is based on individual clinical need and this study is merely observational, with no attempts to randomise people to different durations or types of treatment. While it must be noted that observations made here do not constitute an argument for keeping people in treatment indefinitely, retaining people in treatment for the optimal period demanded by that individual clinical need seems to be a key factor in the observed reductions in convictions. The study does seem to indicate that people who are in treatment for a continuous, extended period (either for the duration of the study or which ends successfully after six months or more) on average, derive greater benefit than those who are not, at least in terms of reduced convictions.

Whether those seeking treatment do so because of criminal sanction, by their own will or for any other reason, appears to have little influence over the amount of reduction observed in conviction rates for each group. As would be expected, those referred by the CJS have a slightly higher conviction rate than those who are not.

Users of opiates and/or crack cocaine are far more likely to have any convictions and are convicted at a higher rate than other users. Notably, those few who use only crack cocaine appear to benefit earlier than opiate users and to a greater degree.

While this is the largest study of its kind so far attempted in England there is still some way to go in establishing a definitive answer as to the quantifiable effect of drug treatment on individual offending. This study builds and improves on the solid foundations laid by Millar et al. (2008)[11] (the nearest direct comparison) by identifying a larger cohort for analysis, a greater scope in the types of treatment considered and doubles the time period observed. Given the differences, it is encouraging that the two studies appear to show similar results.

While the National School of Government's 'Magenta Book'[12] acknowledges this kind of single-group pre and post-test design as limited by its inability to eliminate the impact of confounding influences, it nevertheless acknowledges that it is an acceptable design where there are practical and ethical limitations, as there are here, to establishing a 'non-treated' group. Drug treatments, recommended by NICE as effective in its technology appraisals[13,14] and clinical guidelines[15,16], cannot be ethically withheld in order to generate a control group as this would expose patients and their communities to an unacceptable risk of harm.

In the absence of a definite counterfactual scenario it is not possible to ascribe what proportion of the improvements observed here are solely due to treatment. It is likely that treatment plays the significant part in the process, particularly where individuals are retained for the whole period or complete treatment successfully, but other counterfactual factors such as another event (e.g. the birth of a child) or 'natural recovery' (i.e. change which would have happened

without the intervention) could be the cause of a change in behaviour in some of the people observed.

There are some individuals whose conviction rate appears to increase post treatment entry. In spite of this, the clear trend across the board appears to be a marked reduction in average conviction rates following starting treatment for those identified as convicted offenders prior to doing so. This is irrespective of how individuals are referred into treatment, the substance(s) misused or length of time spent in treatment (although all these factors seem to have a bearing on the amount of reconviction observed).

It would be useful if future analyses were able to compare random groups of treated and untreated individuals. Due to the nature of drug treatment provision, this seems unlikely. Although efforts to devise an ethical solution remain ongoing, ensuring that the characteristics of any identified group (e.g. nature of drug use, problem behaviour, clinical need and general demographics) are the same as the group with which it is compared is the greatest challenge. Further iterations of the DDW will help broaden our understanding of the analysis presented here and will hopefully enable us to analyse greater periods of continuous treatment and its effects.

APPENDICES

APPENDIX A

Selection of cohort

All individuals included in the study are adults who started a new course of drug treatment during the financial year 2006-07. These individuals were then matched via the DDW with any associated PNC activity using their attributor codes: a combination of first and second initials, date of birth and gender.

The PNC has a unique reference per individual (PNCID), as well as attributors. Individuals whose matched records resulted in the following were excluded from this analysis[k]:

- one-to-many combinations, where a single attributor code was associated with more than one PNCID (implying multiple individuals sharing the same attributor)

- many-to-one combinations, where several attributor codes shared the same PNCID (implying mis-recording of either PNCID or attributor)

- combinations where there was a many-to-many relationship between PNCID and attributor code (implying both mis-recording and shared details)

Only those NDTMS clients who had no matching record in the PNC or those who had a one-to-one match were included in this study.

NDTMS information included in this analysis is on a 'treatment journey' basis. A treatment journey is a set of concurrent or serial treatment episodes linked together to describe one continuous period of treatment. This can be within one provider or across a number of different providers. Linked episodes cannot be further than 21 days apart. If an individual had more than one treatment journey during 2006-07 then the first is used in this analysis.

The full cohort has no significant differences from the main drug treatment population in 2006-07:

- 78% of the cohort are opiate and/or crack users (total for new presentations in 2006-07 was 77%)
- 24% were referred by the CJS (2006-07 annual report: 24% of all episodes)
- 70% are male (2006-07 annual report: 72%)
- Median age is 31 (2006-07 annual report: 31)

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[k] More details and specific figures are available in the report detailing the DDW's construction[2]

APPENDIX B

Regression toward the mean

In an observational study based on a pre-post analysis design of the same cohort of treated people and its sub-groups, such as we have here, regression to the mean is a plausible alternative explanation for mean change between two values observed before and after an event (treatment start). This section gives a brief illustration of regression toward to the mean in general and then explains how it has been used to adjust the figures presented in this study.

Regression to the mean is a purely statistical phenomenon which was first observed by Sir Francis Galton in the late nineteenth century[17,19]. Put simply, when measuring observations at two different points, on average those with extreme (either high or low) scores observed in the first round of measurement will tend to be nearer the mean score when observed the second time around.

A simple illustrative example may be a group of 1000 people taking a test consisting of 50 questions to which the answer is 'true' or 'false'. If they were only given the answer sheet, but not the questions, but were still asked to give an answer for each question, each set of answers would represent a set of random variables. By chance, some people will score high and others low but the overall mean score of correct answers for the group would be expected to be near to 25, this being more likely the greater the number of people taking the test. If each person was given the answer sheet again and asked to fill it in a second time, the mean score for the whole group would still be 25, however, those who scored highly in the first test, say the highest scoring 5% with a mean of 45, are highly unlikely to be in the highest scoring 5% in the second test. In fact, if the situation is truly random, this sub-group's mean score in the second test is likely also to be 25. Therefore those with extreme scores in the first measurement, on average, 'regress' toward the group mean in the second measurement. Note that this is not true for each individual but for the highest scoring 5% sub-group on average.

If the test above were repeated with each of the people this time being given the questions and if there were no random guessing, i.e. if each person knew the answer to each question there would be no difference in mean scores between the first and second measurements.

Both of those examples are of extremes. In the first the difference is entirely due to regression toward the mean and in the second example there is no regression as there is no random chance involved. In the real world the reality would be somewhere between the two. Of those who score in the top 5% in a real-world first test some people will know the answers and some will be lucky. For those who are lucky in the first test, they are unlikely to enjoy the same luck in the second and so their score will be commensurately lower, bringing the mean score for this group down in the second test. The opposite would be true for the lowest scoring 5% in that some would improve by chance in the second test. This random element is the driver behind regression toward the mean and occurs when samples are selected non-randomly on the basis of extreme scores from the main population. It is not, however, a causal relationship, more a manifestation of random variation and imperfect correlation.

Regression toward the mean has been used to critique studies of the benefits of speed cameras in reducing road traffic accidents[18] and is explained in much greater detail in Campbell & Kenny (1999)[19].

As discussed above, regression effects occur if individuals are not randomly selected for inclusion in the sample, as is the case here:

Firstly, the individuals in the study differ from the general population in that they are dependent drug users seeking treatment and this is a condition of inclusion.

Secondly, there is a direct link between being convicted for a trigger offence and being referred to treatment. Where 'testing on arrest'[l] is in operation, arrest for a trigger offence means that individual is tested for the presence of certain illegal drugs in their system. A positive test then results in a 'required assessment' (of treatment need) which may then result in referral to treatment[m]; approximately half of those referred this way start treatment as a result. There is also the possibility of treatment being a condition of sentence following a conviction. In certain cases, therefore, an appearance in one dataset (PNC) gives a higher likelihood of being in the other (NDTMS).

Thirdly, the main analysis presented here is based on those individuals with at least one conviction in the two year period prior to starting treatment. In general, the probability of being caught for any offence committed is less than 1. In selecting those with at least one conviction pre-treatment, we automatically raise their probability of having been caught once pre-treatment to 1 while their probability of being caught at least once post-assessment remains less than 1. It is worthy of note, however, that the majority of these individuals actually have more than one conviction in the two-year period, the average being 3.47 as observed in Table 1.

All three of these factors may lead to an artificial inflation of the number of pre-treatment convictions which in turn will create a regression to the mean effect when comparing mean differences pre and post assessment. This is also acknowledged in this specific context in Skodbo et al. (2007)[20] and is visually apparent in Figure 3 below.
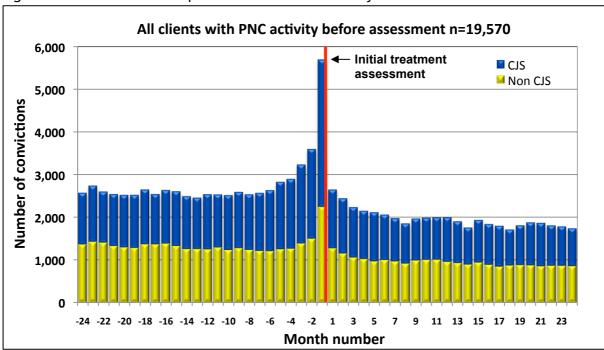
Figure 3. All convictions of pre-treatment offenders by month committed

Figure 3 shows all convictions for those with one or more offences prior to starting treatment by the month (30-day period) in which they were committed. It is obvious that there is a spike

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[l] This system was introduced in certain areas of England and Wales as part of the 'Tough Choices' expansion of DIP which was phased in from April 2006 – the start of our period of selection for treatment starters.

[m] Although actual entry into drug treatment (which is the point when an individual would become eligible for consideration of inclusion in this study) is not compulsory

in convictions near to starting treatment. While some of this will be accounted for by those people referred into treatment as a condition of sentencing, it is pertinent to note that a similar spike is also observed in those people who came to treatment without being referred by the criminal justice system. This perhaps lends weight to the perception that those seeking treatment are often at their most chaotic just before doing so, however, the spike is brought about by a greater number of individuals convicted rather than an increase in the rate of convictions for a static number of individuals. It may also be the case for individuals not directly referred into treatment that a conviction may nevertheless still be a 'final straw' motivation for seeking treatment independently.

As the observed inflation occurs immediately before the treatment event and the mean observations are made over periods of two years, this serves to smooth some of the inflation out; however, further investigation of the regression to the mean effect is necessary.

With reference to Campbell & Kenny (1999) p.40, it is not possible in this study to calculate the exact amount of regression to the mean:

> "The essential problem with the pre-post design without random selection is that the exact amount of regression cannot be known. Only when there is a dramatic change in scores can the researcher be reasonably certain that the change cannot be plausibly explained by regression toward the mean. Weak effects are likely to be obscured by regression toward the mean."

It is possible in this scenario, however, to estimate what the number of post-assessment convictions for each individual might be (Y') if regression to the mean were the only factor causing change. This estimate is based on known observations, using the following formula from p.26 of Campbell & Kenny (1999):

$$Y'=b_{xy}(X-M_X)+M_Y$$

Where X is the pre-treatment number of convictions for the individual, M_X is the mean observed pre-treatment convictions for the whole 53,851 cohort, M_Y is the mean observed post-assessment convictions for the whole cohort and b_{xy} is the regression coefficient.

Having calculated these values, in 1,364 of 19,570 individuals (7%), the observed change is not beyond what could plausibly be explained by regression to the mean. Therefore, in 93% of cases the actual, observed change is beyond what can be attributed purely to a regression effect.

In those 7% of cases where the RTM equation shows that the level of observed change is not dramatic enough to be significant, we can manually adjust the number of post assessment offences so that it equals the number of pre-treatment offences, i.e. adjust it as if there were no change at all, and recreate the analysis using these adjusted figures. All tables in this report are subject to this adjustment over the observed figures.

Adjustment appears to make differences in reduction of convictions of 2-4% under analysis of observed information but the figures' relativity to each other remains broadly the same. Slightly greater differences (i.e. more adjustment) are seen in opiate and/or crack users than in other individuals. As they make up the majority of the group and are more likely to have a larger number of convictions, this is to be expected.

REFERENCES

[1] MacDonald, Z. Tinsley, L., Collingwood, J., Jamieson, P. and Pudney, S.(2005) Measuring the harm from illegal drugs using the Drug Harm Index. http://rds.homeoffice.gov.uk/rds/pdfs05/rdsolr2405.pdf

[2] Millar, T., Ahmad, M., Richardson, A., Skodbo, S., Donmall, M. & Jones, A. (2012) The Drug Data Warehouse: Linking data on drug misusers and drug-misusing offenders. Home Office Research Report 63.

[3] Home Office. Drug Strategy 2010. Reducing Demand, Restricting Supply, Building Recovery: Supporting People to Live a Drug Free Life, 2010. http://www.homeoffice.gov.uk/publications/drugs/drug-strategy/drug-strategy-2010?view=Binary

[4] Gordon, L., Tinsley, L., Godfrey, C. and Parrott, S. (2006) The economic and social costs of Class A drug use in England and Wales, 2003/04, In Singleton, N., Murray, R. and Tinsley, L. (eds) 'Measuring different aspects of problem drug use: methodological developments.' http://rds.homeoffice.gov.uk/rds/pdfs06/rdsolr1606.pdf

[5] Hester, M., Westmarland, N. Home Office Research Study 279. Tackling Street Prostitution: Towards an holistic approach. 2004 http://rds.homeoffice.gov.uk/rds/pdfs04/hors279.pdf

[6] Campbell, R. Working on the street: an evaluation of the Linx Project 1998-2001, Liverpool: Liverpool Hope University. 2002

[7] Pudney, S. The road to ruin? Sequences of initiation into drug use and offending by young people in Britain London: Home Office (HORS 253), 2002.

http://webarchive.nationalarchives.gov.uk/20110220105210/rds.homeoffice.gov.uk/rds/pdfs2/hors253.pdf

[8] NTA. A Long-Term Study of the Outcomes of Drug Users Leaving Treatment, 2010 - http://www.nta.nhs.uk/uploads/outcomes_of_drug_users_leaving_treatment2010.pdf

[9] Effectiveness of community treatments for heroin and crack cocaine addiction in England: a prospective, in-treatment cohort study. The Lancet, pages 1262 - 1270, 10 October 2009 http://www.thelancet.com/journals/lancet/issue/vol374no9697/PIIS0140-6736(09)X6095-2

[10] NTA. Powder Cocaine: How the Treatment System is responding to a growing problem, 2010 http://www.nta.nhs.uk/uploads/ntapowdercocaine1march2010d.pdf

[11] Millar,T. Jones, A. Donmall, M. and Roxburgh, M. Changes in offending following prescribing treatment for drug misuse. 2008

http://www.nta.nhs.uk/uploads/nta_changes_in_offending_rb35.pdf

[12] Government Social Research Unit (GSRU). The Magenta Book: Guidance Notes for Policy Evaluation and Analysis, 2003. http://www.hm-treasury.gov.uk/magentabook

[13] National Institute for Health and Clinical Excellence. Methadone and Buprenorphine for the Management of Opioid Dependence. NICE technology appraisal 114. 2007. http://guidance.nice.org.uk/nicemedia/live/11606/33835/33835.pdf

[14] National Institute for Health and Clinical Excellence. Naltrexone for the Management of Opioid Dependence. NICE technology appraisal guidance 115. 2007. http://guidance.nice.org.uk/nicemedia/live/11604/33814/33814.pdf

[15] National Institute for Health and Clinical Excellence. Drug Misuse: Psychosocial Interventions. NICE clinical guideline 51. 2007 http://www.nice.org.uk/nicemedia/live/11812/35975/35975.pdf

[16] National Institute for Health and Clinical Excellence. Drug Misuse: Opioid Detoxification. NICE clinical guideline 52. http://www.nice.org.uk/nicemedia/live/11813/35997/35997.pdf

[17] Francis Galton. Regression towards mediocrity in hereditary stature. The Journal of the Anthropological Institute of Great Britain and Ireland (The Journal of the Anthropological Institute of Great Britain and Ireland, Vol. 15) 15: 246–263; 1886.

http://galton.org/essays/1880-1889/galton-1886-jaigi-regression-stature.pdf

[18] Davis, G.A. Accident reduction factors and causal inference in traffic safety studies: a review; 1999

[19] Campbell, D. T., Kenny, D. A. A Primer on Regression Artifacts. New York: Guilford Press; 1999.

[20] Skodbo, S., Brown, G., Deacon, S., Cooper, A., Hall, A., Millar, T., Smith, J. and Whitham K. The Drug Interventions Programme (DIP):addressing drug use and offending through 'Tough Choices', 2007 - http://rds.homeoffice.gov.uk/rds/pdfs07/horr02c.pdf