Home Office

New opiate and crack-cocaine users: characteristics and trends

Research Report 90

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Summary

Executive summary

This paper uses a range of datasets and methodologies to:

- obtain working estimates for the number of individuals in England who started using opiates/crack from 2005 to 2013;[1]
- examine the characteristics of these individuals.

The main findings of the paper are as follows.

- It is estimated that around 5,000 to 8,000 individuals started using opiates or crack-cocaine in 2013. There is a high degree of uncertainty around this figure due to the sparse data on this population, but sense-checks based on treatment and criminal justice system data suggest the true figure is unlikely to be much larger than 10,000.
- Data also suggest that the number of current opiate/crack initiates involved with crime may be even lower. The number of arrestees testing positive for the first time for opiates (or for both opiates and crack-cocaine) dropped from 14,750 in 2006 to 4,281 in the first 11 months of 2013, a fall of around 70 per cent[2]. Furthermore, of the new positive testers in 2013, only 721 were aged 18–24.[3] Though this arrestee data will capture only a proportion of the true population, it does suggest that the number of new, young initiates involved with crime – those who have the potential to inflict most societal harm – has decreased markedly, probably just to a few thousand per year; and that this group now make up a small minority of the total number of opiate/crack-cocaine users (estimated to be 294,000 in 2011/12), most of whom are older, longer-term users.
- In terms of trends in new opiate/crack-cocaine users, all available data suggest that figures have dipped by at least a fifth since 2005 and have dropped hugely since the late 1980s and early 1990s when the opiate/crack-cocaine population in the UK grew very rapidly. The current estimate works out at a rate of 0.18 per 1,000 population. During the epidemic years, published estimates of new opiate/crack-cocaine users in Manchester and Bolton show rates more than 11 times larger.
- However, the findings also suggest that between 2011 and early 2014, the number of new opiate/crack-cocaine users stopped decreasing and instead stabilised at a (historically) low level. Further analysis was conducted to try and determine whether this was a precursor to a new rise in initiates. Though the data are not totally conclusive, the results suggest that a marked increase in new opiate/crack-cocaine users in the near future is unlikely. If anything, findings suggested that the downward trend may be set to resume.
- Analysis also revealed some possible changes in characteristics of the new opiate/crack-cocaine initiates. There is a trend in the treatment data towards new initiates coming to treatment earlier in their drug-using careers than previous cohorts and also to have

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1 At the time of writing, data was unavailable for the period after November 2013.
2 It is 68 per cent if the 2013 figure is adjusted to correct for the missing month of data.
3 787 if adjusted for the missing month.

initiated use at an older age. Currently it is not possible to determine whether this is a reporting issue or a genuine shift in the age profile of new opiate/crack-cocaine users.

- The report has several important policy implications. Even though numbers of new initiates involved with crime have dropped to the low thousands, putting downward pressure on crime, identification and early diversion to treatment remains paramount. Frontier Economics have estimated that the average[4] lifetime crime cost of an injecting drug user is £445,000, so the potential for social harm – even from a small number of individuals – remains large and potentially long-lasting. This means local areas need to manage both the (relatively large) stock of current users, and the (much smaller) flow of new initiates, whose treatment needs may be different. There is no evidence of any new epidemic in this country, but given the impact of the epidemic of the 80s and early 90s on crime, ongoing monitoring of recent trends is required to spot early signs of any emerging problems.

Aims and Methodology

Previous Home Office research has demonstrated the importance of opiate/crack-cocaine use in driving aggregate trends in acquisitive crime (Morgan, 2014). While established estimates exist of the *total* number of opiate/crack-cocaine users (OCUs) in England (Hay *et al*., 2013), there are no estimates for the number of *new* OCUs each year (throughout this paper the number of new OCUs is also referred to as **'incidence'**). This is important for three main reasons.

i) **Stock and flows:** Simply knowing the stock of OCUs tells us nothing about the flows in and out – i.e. if the stock were constant each year that could mean that no one starts using these drugs and no one quits or it could mean *all* existing users quit but that they are wholly replaced by new users, or any similar scenario in between. Clearly the policy response would need to be quite different for each of these cases, so knowing the true situation is important.

ii) **Early-warning system:** Research by the Home Office and others has shown that there is generally a lag between the start of a heroin/crack epidemic and the point at which it becomes visible on administrative datasets. Closing this gap is important for policy, and part of the reason for its existence is the lack of incidence estimates. Evidence also suggests epidemics spread from area to area, so it is important to monitor local as well as national trends.

iii) **The social harm that can arise:** Though research suggests that not all OCUs resort to acquisitive crime to help finance their drug use, numerous studies show that a proportion consistently do and these individuals can be extremely prolific offenders (Morgan, 2014). One study by Frontier Economics estimated that the average lifetime cost to society of an injecting drug user was £445,000 from crime alone. Hence analysing and identifying new OCUs is a policy priority (Frontier Economics, 2010).

There are two inter-connected reasons why regular national incidence estimates have not been attempted before[5]. The first is that data on this issue are sparse given the 'hidden' nature of opiate/crack markets and that date of first use is not something that gets recorded at the moment it actually occurs. The second reason, which flows from the first, is that current

[4] The average is useful, but hides the fact that offending within the opiate/crack population is highly skewed with a few individuals responsible for the majority of crime and many individuals manage to use heroin and crack without resorting to acquisitive crime at all (Morgan, 2014).

[5] Though regular national-level estimates have not been attempted, studies have estimated incidence at various times and at various different levels of geography, see for example: De Angelis *et al*., 2004, Millar *et al*., 2001 and Hickman *et al*., 2001.

methods for calculating incidence are complicated and imperfect. It should be acknowledged in advance that this paper does not fully resolve these issues. It is merely intended as a first step, to obtain workable estimates upon which to base policy until more sophisticated methods are developed. That said, every effort is made in this analysis to sense-check the results against other available datasets. The datasets used and the structure of the paper is as follows.

i) **Drug Interventions Programme (DIP) data.** In part one, we produce general descriptive statistics from these data, which capture individuals who test positive for opiates/crack-cocaine following arrest or charge. Due to the limitations in coverage of these data over time, we draw only broad conclusions, some of which act as a sense-check for the main results from part two.
ii) **Data on presentations to treatment from the National Drug Treatment Monitoring System (NDTMS).** In part two, we use two models based on previous research papers to calculate OCU incidence at the national level between 2005 and 2013. Most of the main conclusions come from this section.

1. Drug Interventions Programme Data

The Drug Interventions Programme (DIP) was introduced in April 2003 with the aim of developing and integrating measures for directing adult drug-misusing offenders into drug treatment and reducing offending behaviour. Offenders charged with certain 'trigger offences' (mostly acquisitive crime or drug offences) were drug tested and those testing positive were required to have a drug treatment assessment.

This section contains a series of descriptive statistics taken from the DIP dataset covering the years from 2004 to 2013. The particular focus is on analysis that can shed light on trends and characteristics for *new* opiate or crack-cocaine users (OCUs). Because it is a dataset predicated on involvement with the criminal justice system it is only representative of a subset of OCUs: those who have been arrested or charged with an offence – mostly an acquisitive crime offence (around 85 per cent of the offences leading to a positive drugs test are acquisitive[6]). Research has shown that up to half of all OCUs commit little or no acquisitive crime (Gossop et al, 2003; Morgan, 2014). So the analysis in this section provides only a guide to the numbers, trends and characteristics for the *total* number of new OCUs. But it does provide a helpful picture for the crime-involved subset of new OCUs.

Aspects of DIP have changed over time and this affects the data available, so it is important to run through them briefly. In 2005, testing was switched from the point of charge to the point of arrest. DIP was introduced in different areas in waves with the total number of areas increasing through 2004 to 2006. After this point, there was more consistency in DIP's geographical coverage, though some other areas that were not part of the nationally funded programme, did choose to run their own drug-testing-on-arrest programmes and some of these data have also been collected within the DIP data. This process increased slightly from 2010 when all police forces in England and Wales were given authorisation to conduct drug testing and related treatment interventions. This enabled local partners in all areas to decide whether or not to introduce drug testing as a locally driven approach to reducing drug-related offending. Again, some of these data were also captured alongside the data from the original DIP areas. In April 2013, DIP ceased to be a nationally funded programme. Instead, Police and Crime Commissioners (PCCs) were given the power to decide which local interventions (including drug testing on arrest) they would fund to address Class A drug-related offending. Drug testing continues to operate in many areas across England and Wales, but in some areas there may be drop-off in the data from that point.

A full discussion of DIP's geographical coverage over time is contained in the Appendix, which also shows how the available data break down by local authority area. While there is some variation in the number of local authorities returning DIP data, particularly post-2006, areas with higher test volumes are well covered throughout the period. So, while any trend should be treated with care, more confidence can be taken in the analysis of the year of birth and age characteristics.

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[6] See Appendix 3 in: http://socialwelfare.bl.uk/subject-areas/services-activity/substance-misuse/homeoffice/141816horr02c.pdf

DIP tests have four main outcomes: positive for opiates (which mainly indicates heroin use); positive for cocaine use (which may indicate powder- or crack-cocaine use); positive for both; or negative. Data are available from 2004 to 2013 as shown in Table 1, though the 2013 data cover the period up to November 2013 only, so in this and subsequent tables we include an additional column '2013 adjusted', which simply multiplies up the existing 2013 figures by 1.09 (12 divided by 11) to account for the missing month's data.[7]

Table 1: Results of all DIP tests, 2004–2013.

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2013 adjusted	Total	Adjusted Total
Negative	30,858	43,218	112,604	128,867	143,047	155,327	155,541	149,449	114,149	68,274	74,481	1,101,334	1,107,541
Cocaine	8,231	9,963	20,986	32,021	34,413	21,753	24,412	31,486	26,642	16,558	18,063	226,465	227,970
Opiates	9,159	12,071	20,070	17,314	17,279	25,082	21,499	14,824	11,981	8,736	9,530	158,015	158,809
Both (Cocaine & Opiates)	11,943	17,234	29,972	35,235	32,082	19,517	20,033	16,387	13,525	10,594	11,557	206,522	207,485
Total (opiates + both)	21,102	29,305	50,042	52,549	49,361	44,599	41,532	31,211	25,506	19,330	21,087	364,537	366,294
Total (All)	60,191	82,486	183,632	213,437	226,821	221,679	221,485	212,146	166,297	104,162	113,631	1,692,336	1,701,805
Opiates/both as a percentage of total tests	35%	36%	27%	25%	22%	20%	19%	15%	15%	19%	19%	22%	22%
Total arrests for acquisitive crime	535,900	497,700	498,200	485,454	458,627	458,544	420,016	416,672	388,897	336,669	336,669	4,496,679	4,496,679
Difference between total arrests and number of DIP tests	475,709	415,214	314,568	272,017	231,806	236,865	198,531	204,526	222,600	232,507	223,038	2,804,343	2,794,874
DIP tests as a percentage of total acquisitive crime arrests	11%	17%	37%	44%	49%	48%	53%	51%	43%	31%	34%	n/a	n/a

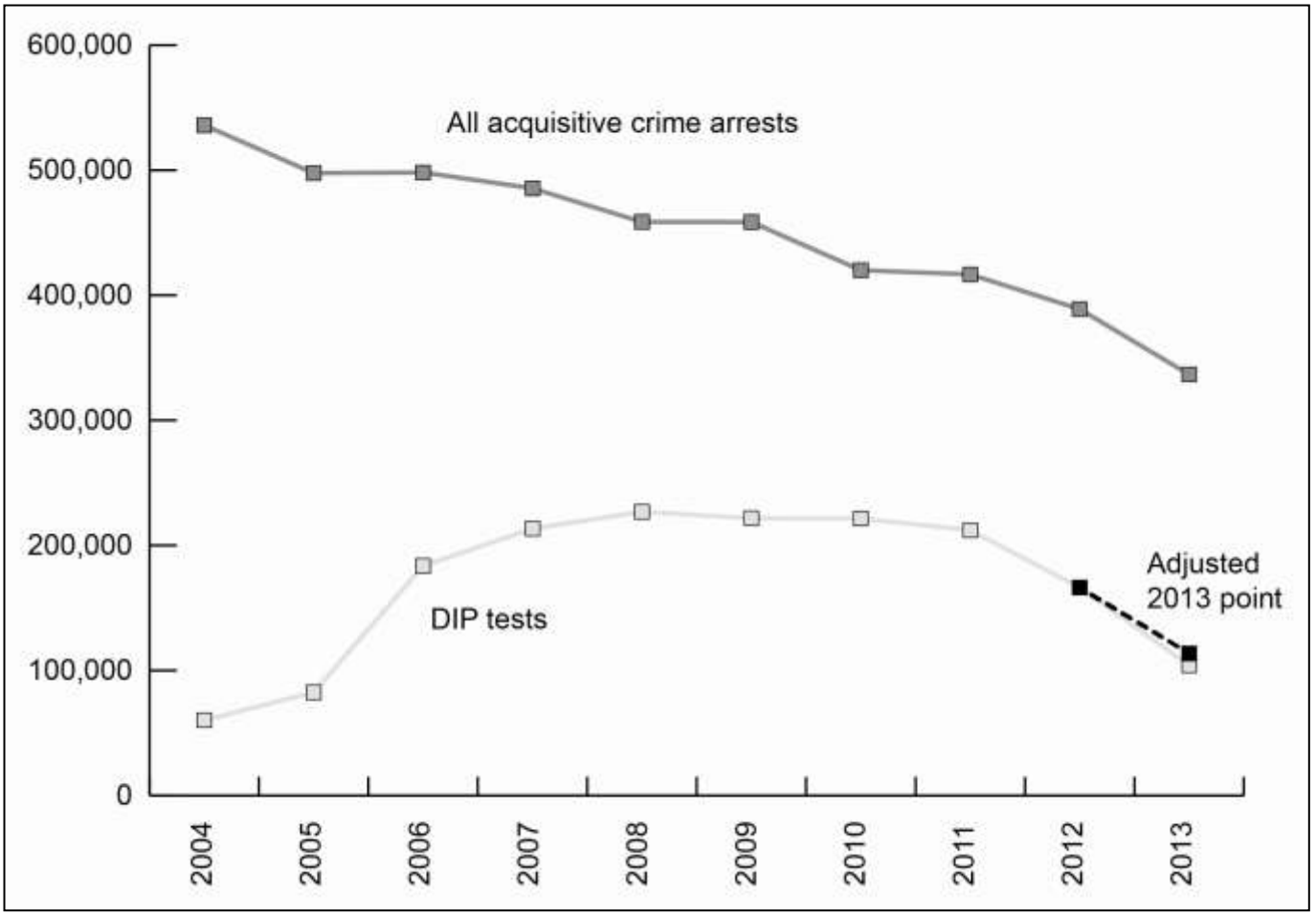
For context, Table 1 also includes data on total acquisitive crime arrests.[8] Comparing the trends

[7] Note that individuals aged 65 and over or who had a year of birth before 1959 were excluded.

[8] The total acquisitive crime arrests were calculated from the data to be found here: https://www.gov.uk/government/statistics/tables-

in DIP tests with total acquisitive crime arrests reinforces some of the trend-related limitations of the DIP data.

Figure 1: Total DIP tests and total acquisitive crime arrests.



The steadily falling trend in arrests corresponds with the steadily falling trend in acquisitive crime, as measured both by police statistics and the Crime Survey of England and Wales (ONS, 2014). The number of DIP tests follows a quite different trend for most of the series. That the two trends differ is to be expected for the following reasons.

i) Around 15 per cent of offences for which DIP tests were given were for non-acquisitive crimes.
ii) DIP only tests individuals aged 18 and over (and we excluded those aged 60+) whereas arrests will include individuals outside this age range.
iii) Until 2006 DIP testing occurred at the point of charge rather than arrest, and not all arrests result in a charge. The result of this is that the number of DIP tests would be likely to increase markedly from 2004 and 2005 to 2006.
iv) DIP's geographical coverage was not 100 per cent, and varied through the series (see Appendix).

With these caveats in mind, it is clear that the increase in total tests (and hence total positive tests) in the early years of the series is almost certainly due primarily to the expansion of DIP (points iii and iv), rather than because of an increase in the actual number of opiate and/or

for-police-powers-and-procedures-england-and-wales-2012-to-2013. Table A.02 was used and the data for 'theft and handling', 'robbery' and 'burglary' were summed. Note that this series is in financial years rather than calendar years so the figures shown for 2005 actually cover 2005/06.

cocaine users. In addition, the sharp decline in total DIP tests in 2013 may be due in part to the fact that DIP ceased to be a nationally funded programme in April 2013.

These data do show, however, that from 2006 onwards, between a third and half of all acquisitive crime arrests involved a drug test and between 15 per cent and 35 per cent of those tests (depending on the year) resulted in a positive result for opiates-only or for both opiates and cocaine (hereafter labelled `positive-for-both').

The reason for highlighting only the opiates-only and the `positive-for-both' test results is that the primary group of interest in this report are opiate and crack-cocaine users. To capture this group, cocaine-only tests must be excluded because DIP tests cannot distinguish between powder- and crack-cocaine, so a cocaine-only positive test could indicate either. Previous evidence has demonstrated that while there is much overlap between heroin and crack-cocaine cohorts (i.e. many of those who use heroin also use crack-cocaine), *powder*-cocaine users have a quite different profile and are far less likely to be involved with acquisitive crime. Excluding the cocaine-only tests means we can be guaranteed not to capture any powder-cocaine users (who are not also using opiates or crack), but it also means we may miss some crack-cocaine-only users, hence the figures may under-estimate the true population of OCUs slightly.

The fifth row in Table 1 shows that the total number of opiate and opiate/cocaine tests over the period was 364,537. Table 2 shows descriptive statistics for the individuals providing these tests (noting that the same individual may be included several times if they gave multiple positive tests).

Table 2: Descriptive statistics on all positive opiate-only/positive-for-both tests.

Opiate/opiate+cocaine positive tests in England 2004–2013 (all positive tests including repeats by the same individual)			
Age		Year of birth	
Number of tests	364,537	Number of tests	364,537
Mean	32	Mean	1977
Median	31	Median	1977
Mode	28	Mode	1979
Minimum	18	Minimum	1960
Maximum	53	Maximum	1995

The mean age at test is 32 and the mean year of birth is 1977, implying that most of these individuals were in their mid-to-late teens during the crime peak of the mid-1990s.[9] Given evidence suggesting that the average age of initiation for opiate/crack use is around 18–20 (Millar *et al*., 2001), this age profile would tentatively suggest that OCU incidence also peaked in the 1990s and that this created a large cohort of users who would be approaching 40 today.

The minimum and maximum years of birth are fixed by construction, because anyone born

[9] Note that the dataset counts tests, not unique individuals, so the same person can appear more than once.

before 1960 was removed and because DIP tests are only administered to those aged 18 and over, so only using data to 2013 means it would not be possible for anyone to be born in 1996 or afterwards to be included. Even so, it is clear from the year-of-birth distribution (Figure 2) that positive opiate tests drop off sharply for those born after 1982. This is in line with other evidence suggesting that the number of *new* users of opiates decreased sharply in the 2000s. This needs to be considered when interpreting the analysis that follows. When DIP and the NDTMS treatment system began in the mid-2000s, there already existed a cohort of around 320,000 OCUs, according to available estimates by Hay *et al*., (2013). And most of these individuals began using opiates/crack during the epidemic years of the 1980s and 1990s. In terms of data capture this means it is hard to separate the gradual inclusion of more and more individuals from this original cohort from genuinely new users of these drugs.

Figure 2: Year of birth distribution for all opiate-only/positive-for-both tests.

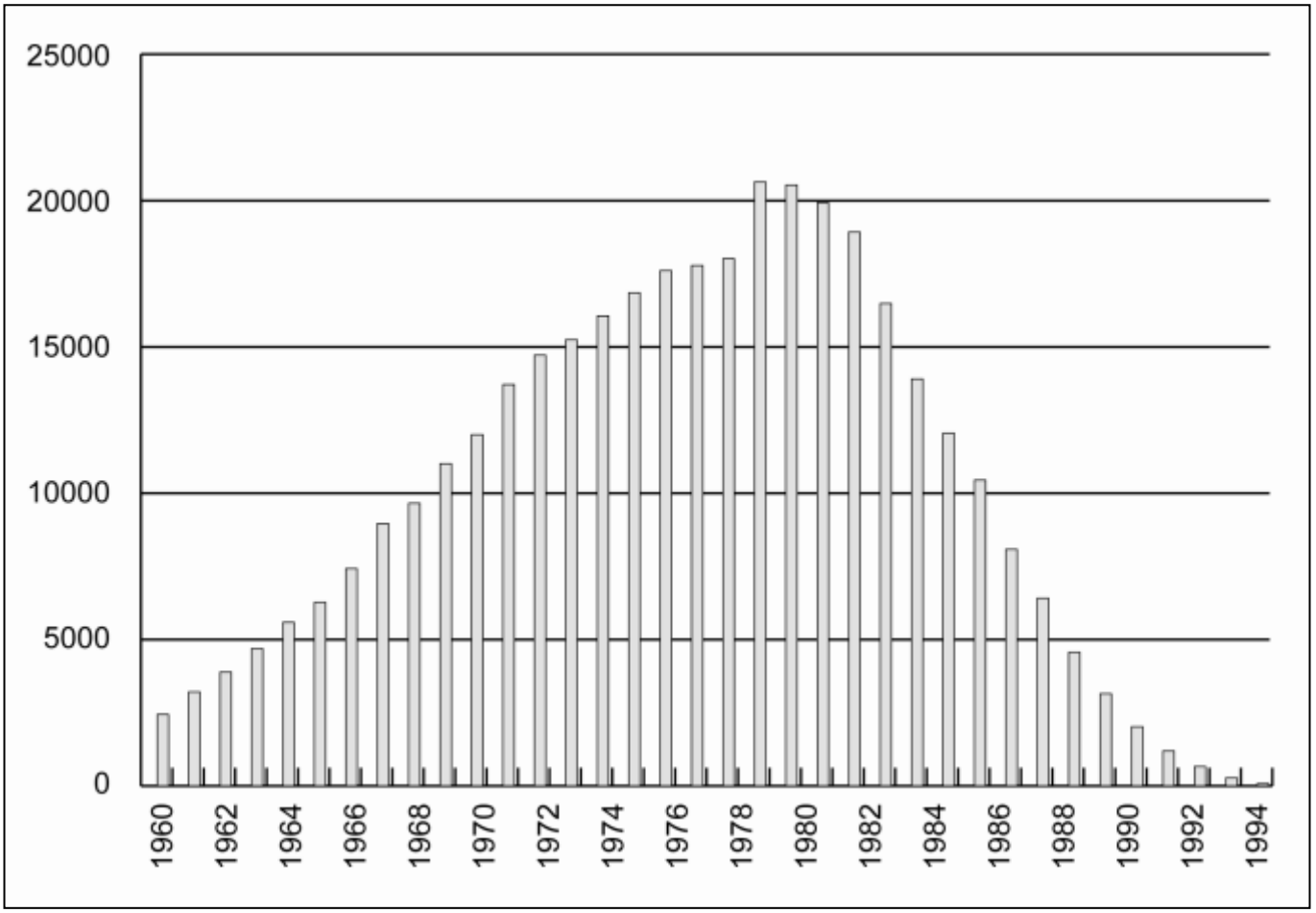
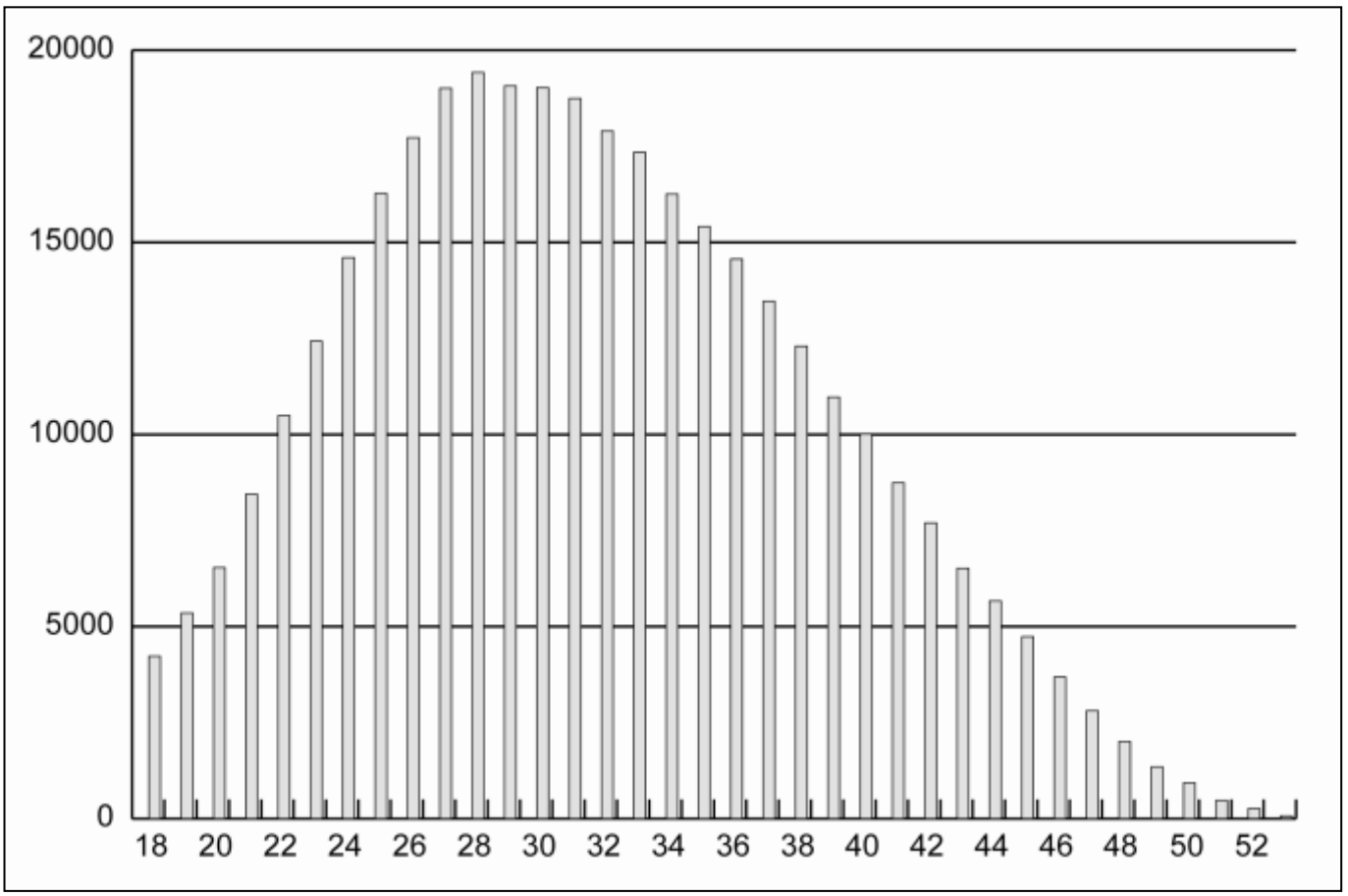


Figure 3, which shows the age of the individual at a positive test, also reveals that although the average age at positive test is 32, the peak is quite flat, with high numbers of positive tests still being recorded by individuals in their late 30s and even into their 40s.

Figure 3: Distribution of tester's age at positive test for all opiate-only/positive-for-both tests.



Note: as a guide to the OCU population, this chart is left-truncated as DIP tests are not given to under-18s.

The above statistics include tests in which no Police National Computer (PNC) number was recorded for an individual. This number is needed to identify an individual and hence to check whether future tests are further tests by that individual or represent a new individual testing positive. Excluding tests in which no PNC number was recorded makes little difference to the descriptive statistics, see Table 3 below.

Table 3: Descriptive statistics for the DIP positive opiate-only/positive-for-both tests in which an individual can be identified with a PNC number.

All positive opiate/opiate+cocaine tests (including repeats) that were recorded on PNC; England 2004–2013			
Age		Year of birth	
Number of tests	296,008	Number of tests	296,008
Mean	32	Mean	1977
Median	31	Median	1977
Mode	28	Mode	1979
Minimum	18	Minimum	1960
Maximum	53	Maximum	1995

The age and year of birth distributions are also similar and are shown in the Appendix. Thus, for the majority of the analysis that follows, tests with no PNC number were excluded.[10]

The charts and tables above use data from *all* positive tests, so will include cases where the same individual has tested positively on more than one occasion. The following data look just at the *first* test for each individual testing positive for opiates-only or positive-for-both.

Table 4: Descriptive statistics on first positive opiate-only/positive-for-both tests.

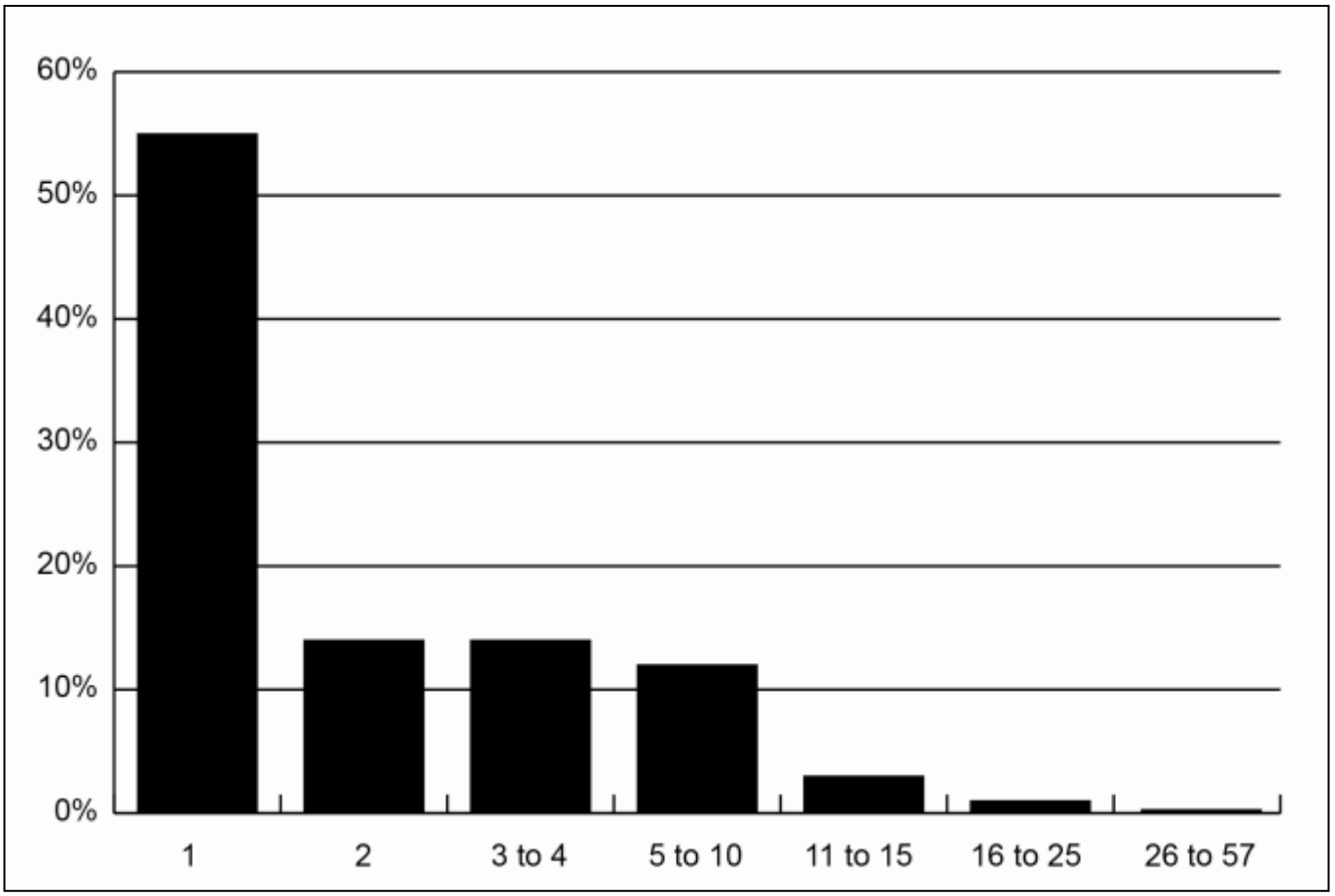
First positive opiate/opiate+cocaine tests (unique individuals)			
Age		Year of birth	
Number of tests	104,817	Number of tests	104,817
Mean	31	Mean	1977
Median	30	Median	1977
Mode	27	Mode	1980
Minimum	18	Minimum	1960
Maximum	53	Maximum	1995

There were just over 100,000 unique individuals who tested positive for opiates-only or positive-for-both between 2004 and 2013. The distribution of the 296,008 positive tests these individuals gave, shows that the vast majority (55%) were only tested once (see Figure 4), which is likely to be why the age statistics are quite similar between Table 3 and Table 4. However, within this

[10] Examining the data it is also clear that some areas recorded a higher proportion of cases without a PNC number than others. Thus excluding these cases further affects the variation in geographic coverage across time. See Appendix for more.

population there exists a small group of frequent repeat users. 1,828 individuals (1.7% of this population) accounted for just over ten per cent of all positive tests (30,471 tests in total). These individuals provided between 16 and 57 positive tests over the period 2004 to 2013.

Figure 4: Proportion of positive tests by number of times an individual tested positive.



The age and year-of-birth distributions for the 104,817 individuals reveals a similar profile to the distribution for total tests (Figures 5 and 6).

Figure 5: Year of birth for all individuals on their first positive test (opiates-only or positive-for-both.)

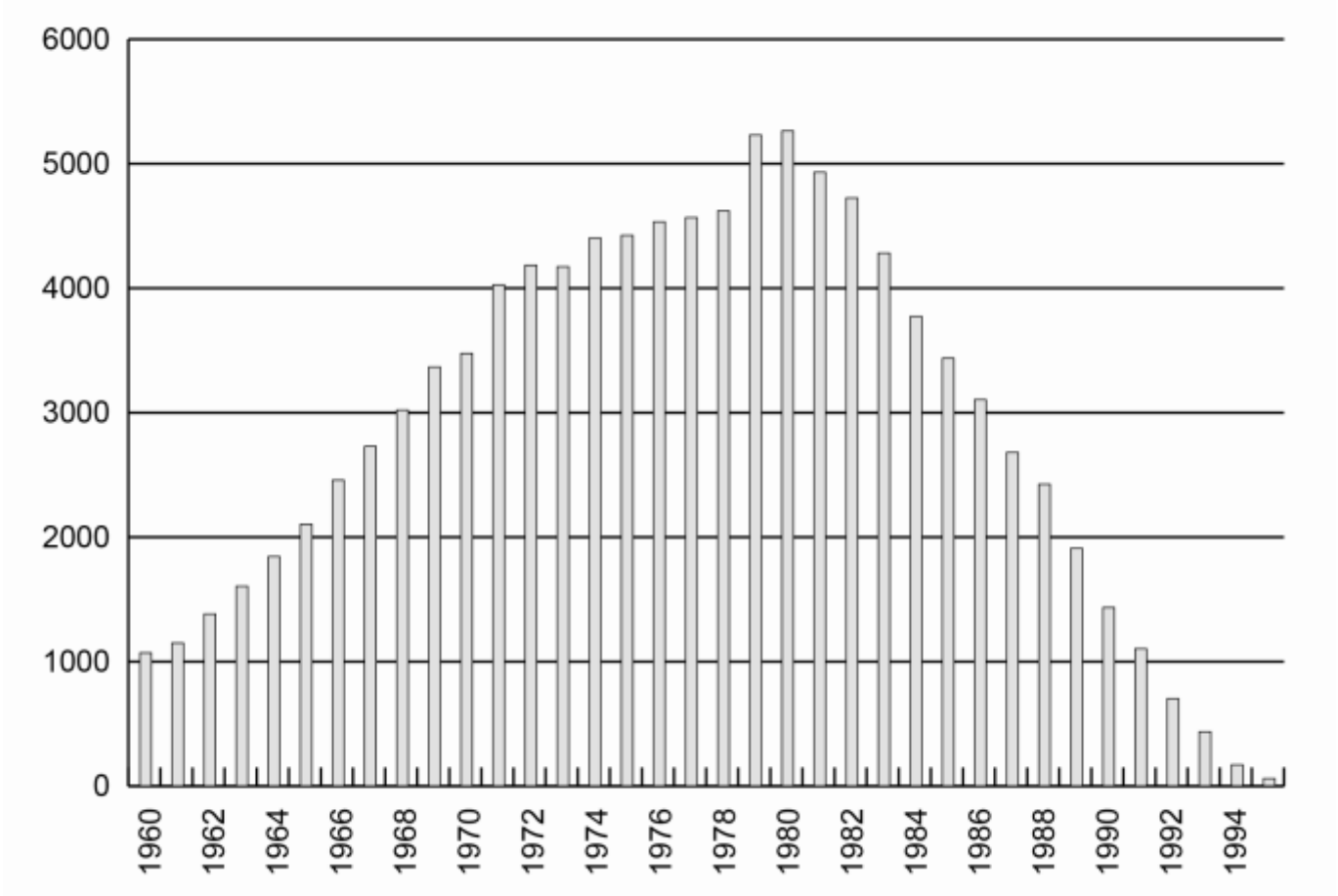
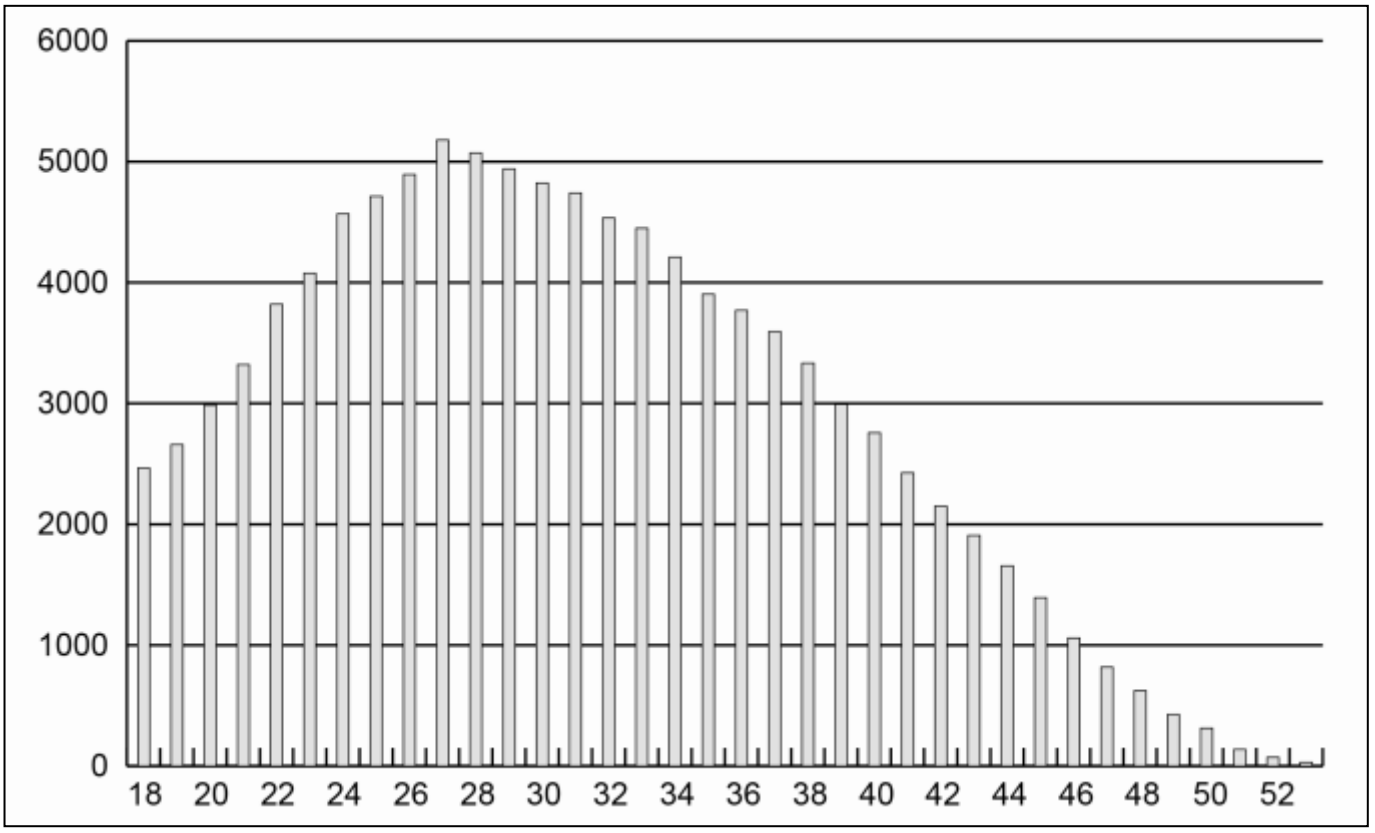


Figure 6: Age at first positive test (opiates-only or positive-for-both.)



Note: as a guide to the OCU population, this chart is left-truncated as DIP tests are not given to under-18s.

The relationship between the total opiates-only or positive-for-both tests and the individuals responsible for them can also be shown over time, as Table 5 illustrates[11].

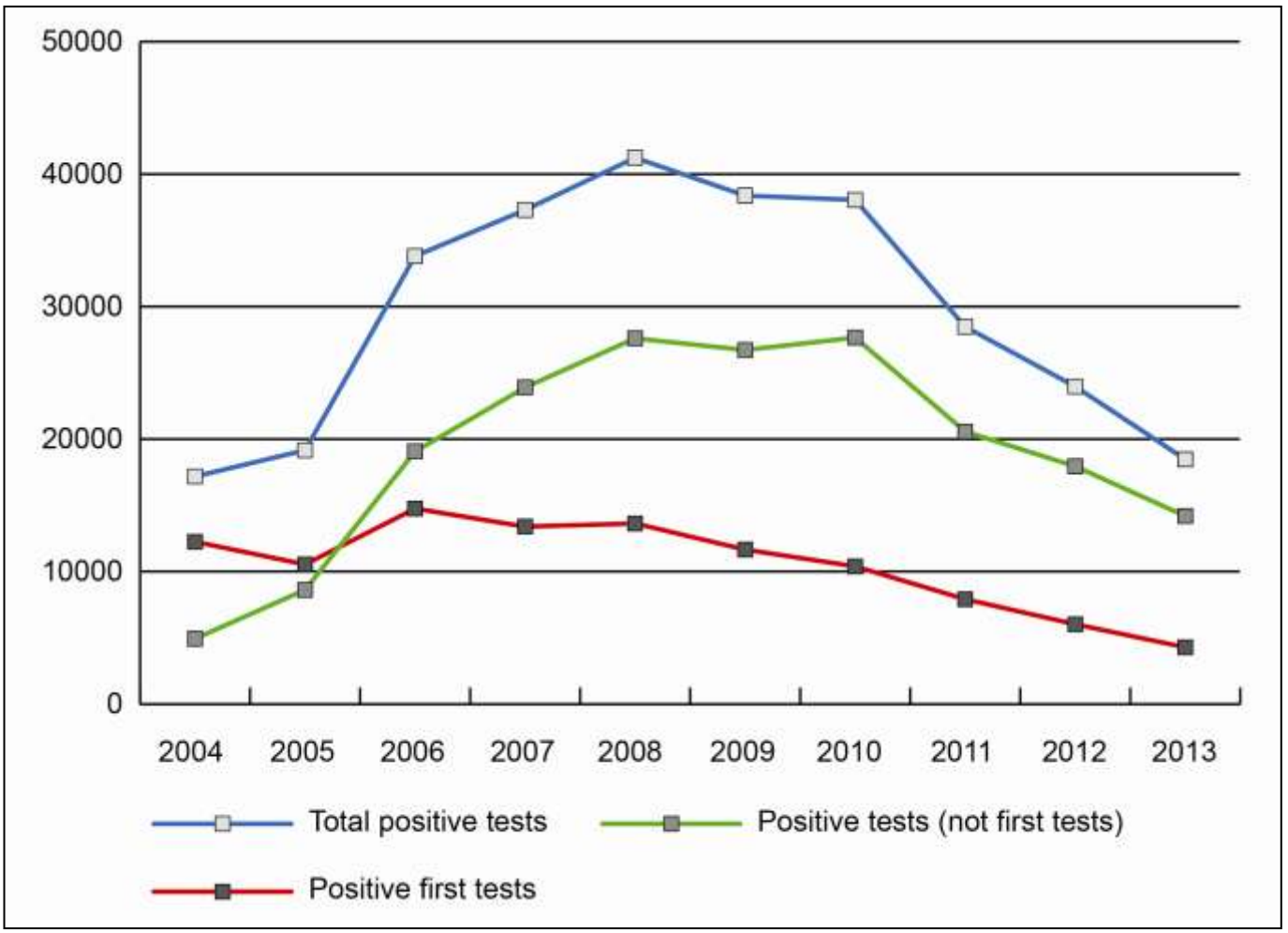
Table 5: Table showing trends in total positive opiates-only or positive-for-both., in unique individuals testing positive, and in *new* individuals testing positive.

Total positive for opiate/ positive for both tests													
Year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total	Adjusted 2013	Adjusted Total
Total positive tests	17,174	19,157	33,813	37,291	41,232	38,376	38,051	28,476	23,965	18,473	296,008	20,152	297,687
Number of unique individuals with a positive test that year	12,246	13,710	21,069	22,916	25,442	23,973	23,618	18,843	16,195	12,353	190,365	13,476	191,488
Number of *new* individuals with a positive test	12,246	10,539	14,750	13,391	13,629	11,655	10,391	7,913	6,022	4,281	104,817	4,670	105,206
Cumulative number of new individuals testing positive	12,246	22,785	37,535	50,926	64,555	76,210	86,601	94,514	100,536	104,817	n/a	105,206	n/a
% new	100%	77%	70%	58%	54%	49%	44%	42%	37%	35%	n/a	35%	n/a

Of central interest for this paper is the third row which shows numbers of individuals testing positive for opiates only or were positive-for-both for the first time. All the previous caveats about DIP trends need to be borne in mind when looking at those figures. Clearly the rise in new positive testers in the early period will be affected by the changes to DIP coverage through those years, as possibly will the sharp fall in positive testers in the latter period. However, graphing the data (see the red line in Figure 7 below) shows that the fall from 14,750 new positive testers in 2006 to 4,281 in 2013, is not only large (the drop is around 70 per cent even if we use the adjusted figure for 2013) but also more or less linear. This means that there is no immediate reason to suggest that the 2013 figures are artificially low due to changes in DIP coverage (i.e. the fact that DIP ceased to be a centrally funded programme in April of that year). Taken together, the data from the period post-2006 (when DIP had achieved a high level of coverage) certainly appear to show that the number of new crime-involved OCUs is unlikely to be rising and may be falling markedly, see Figure 7.

[11] Individuals may have more than one positive test in a given year, which is why the numbers for tests are higher than the numbers for individuals. Similarly, even new individuals not previously testing positive in a given year, may have multiple positive tests in the first year in which they test positive.

Figure 7: Trends in total positive tests divided between those that are the individual's first positive test and those that are subsequent positive tests.



However, caution needs to be exercised. Not only will this trend be affected by the changing level of DIP coverage but also DIP only started in 2004 so every new individual who tests positive in that year is effectively 'new'. This means that because the probability of arrest, for any offence committed, is less than one (i.e. not everyone gets caught), it is likely that there will be a natural downward bias in the trend for positive first tests. To see this, imagine a population of 100 OCUs who commit one crime each year. If the probability of arrest is 20 per cent, 20 individuals will show up in the DIP data as 'first positive tests' in the first year. In the second year, 16 will show up from the original cohort (80 x 20%), alongside 20 per cent of any *new* crime-involved OCUs joining the population that year.[12]

So the sharply falling trend cannot simply be interpreted as a sharp fall in the number of genuinely *new* crime-involved OCUs, as the figures will also be capturing declining numbers of the original cohort. Looking at the fourth row in Table 5 we can see that it is only in 2012 that the total number of unique individuals testing positive exceeds 100,000. Given that available estimates suggest the total number of OCUs in the mid-2000s was around 300,000 (Hay *et al*., 2013), it is clear that plenty of the pre-existing population probably appear as 'new' positive testers right the way through the series.[13]

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[12] Note that this assumes individuals do not become more likely to be arrested once they have already been arrested once, which may not be true if, for example, they became a known 'face' amongst the police.

[13] We certainly would not expect the whole of the 330,000 original population to appear in the data, given that: 1) Evidence suggests up to half finance their drug use without resorting to acquisitive crime (Morgan, 2014); 2) Some of the crime-

Despite this, there are still a few things these data *can* tell us about the numbers and trends in new OCUs. Firstly, despite the downward bias outlined above, it is clear that there are not *enough* new crime-involved OCUs entering the population to cause this trend to increase or even flatten. Secondly, it is assumed that the probability of arrest stays roughly constant through the period, the trend in the number of new positive testers, who are actually captured from the original cohort, will gradually flatten, whereas the decline in new OCUs in the DIP data is almost linear, suggesting that numbers entering the population are also falling. But most important is that the absolute number of new positive testers in 2013 is only 4,281. Given that this figure is likely to include some individuals who are actually long-standing OCUs, but who have evaded arrest to that point, then the number of genuinely new arrested OCUs in 2013 must be lower than 4,281, possibly markedly lower.

To investigate this further, the next two tables break down annual totals for all tests and all unique individuals, by the year of first test.

Table 6: Number of positive opiates-only or positive-for-both. tests, by year of first positive test.

	Number of tests per year (positive opiate/opiate + cocaine)										
Year of first test	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**Adjusted 2013**
2004	17,174	5,604	7,091	6,784	6,509	5,292	4,863	3,341	2,629	1,800	1,964
2005		13,553	6,066	5,110	4,941	3,983	3,549	2,323	1,947	1,383	1,509
2006			20,656	7,784	6,152	5,139	4,629	3,257	2,649	1,806	1,970
2007				17,613	5,747	4,309	3,855	2,619	2,119	1,555	1,696
2008					17,883	4,970	4,026	2,626	2,180	1,562	1,704
2009						14,683	4,054	2,383	1,824	1,318	1,438
2010							13,075	2,332	1,638	1,154	1,259
2011								9,595	1,714	1,013	1,105
2012									7,265	1,359	1,483
2013										5,523	6,025
Total	17,174	19,157	33,813	37,291	41,232	38,376	38,051	28,476	23,965	18,473	20,152

involved opiate/crack users will quit (or die) before being arrested and tested; 3) DIP's geographical coverage is not 100 per cent; 4) Some may evade arrest through the entire series; and 5) Evidence suggests OCUs cycle in and out of periods of regular use and offending rather than offend at a high rate continuously. But clearly the gradual capture of the pre-existing population creates a big enough bias such that we cannot read the figures for *new* positive testers simply as an incidence trend for crime-involved opiate/crack users.

Table 7: Number of unique individuals testing positive for opiates-only or positive-for-both, by year of first positive test.

	Number of unique individuals with positive opiate/opiate + cocaine tests per year										
First test year	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	Adjusted 2013
2004	12,246	3,171	3,299	3,090	2,992	2,573	2,311	1,766	1,513	1,092	1,191
2005		10,539	3,020	2,539	2,478	2,083	1,844	1,350	1,156	862	940
2006			14,750	3,896	3,280	2,701	2,507	1,819	1,610	1,140	1,244
2007				13,391	3,063	2,291	2,091	1,567	1,334	954	1,041
2008					13,629	2,670	2,263	1,612	1,366	978	1,067
2009						11,655	2,211	1,431	1,125	847	924
2010							10,391	1,385	1,052	733	800
2011								7,913	1,017	643	701
2012									6,022	823	898
2013										4,281	4,670
Total	12,246	13,710	21,069	22,916	25,442	23,973	23,618	18,843	16,195	12,353	13,476

These tables can be read both horizontally and vertically. Reading vertically (i.e. down the columns) it can be observed, for example, that of the 12,353 individuals with a positive test in 2013, 4,281 (35%) had not had a previous positive test and over half had already tested positive at least once in 2010 or before.
Reading horizontally – for example from left to right across the first row – it can be concluded that of the 12,246 individuals testing positive in 2004, 3,171 also had a positive test in 2005; 3,299 of the original 12,246 also had a positive test in 2006 and so on. The table does not show whether those who had a subsequent test in 2005 were the same individuals as those who had a subsequent test in 2006. So reading the results of the two tables together, we can say that 12,246 *individuals* had 17,174 positive tests in 2004, and of these, 3,171 also tested positive in 2005, resulting in 5,604 positive tests because some tested positive more than once in that year. The last figure in each column gives the number of new users that year (10,539 in 2005, 14,750 in 2006 and so on).

There are several observations to be drawn from these tables. First, it is clear that a proportion of opiate-using offenders offend over long periods of time. Nearly ten per cent (8.9%) of individuals who tested positive for opiates at charge in 2004 also tested positive nearly a decade later in 2013 (on arrest). And reading vertically, of the 12,253 individuals testing positive in 2013, 1,092 (8.9%) had also tested positive almost a decade earlier.

Second, in relation to incidence, these numbers also allow for some back-of-the-envelope modelling to address the extent to which the figure of 4,281 individuals, who are *new* positive testers in 2013, is an under- or over-estimate of the number of new OCUs in total. Taking the figures for 2008, when DIP was fully up and running, we know that around 25,000 unique individuals had positive tests that year. This can be combined with available estimates of the total OCU population (Hay *et al*., 2013) and the proportion who are likely to be offending (Gossop et *al.*, 2003; Morgan, 2014) to give an approximate arrest rate. i.e. if there were about 150,000 crime-involved OCUs through the period, this implies an arrest rate of about 17 per

cent (25,000/150,000).[14] It is then possible to model how many of the original population of crime-involved OCUs would be likely to test positive in any given year. For example, if there were 150,000 crime-involved OCUs in 2008, the chances of one of that group having a first test in 2013, providing they remained a crime-involved OCU throughout the period 2004–2013 is given by:

(1 – probability of arrest)^8 = chance of not getting caught between 2004 and 2012

Multiplied by:

Probability that they do get arrested in 2013

This can then be calculated for a range of plausible values for the initial number of OCUs, and hence range of arrest rates, to give a range of plausible values for the number of *new* testers in 2013 who were actually longer-term users. The results of this modelling suggest that we would expect about 2,400–7,000 new positive tests from individuals who are actually longer-term OCUs.[15] So the fact we only see 4,281 in the real data suggests that genuinely new initiates may be a minority within this figure, as many (probably most) will be from the original cohort.

This is further reinforced by the next set of analyses, which break down the data on new positive tests per year by age. Table 8 shows how numbers of unique individuals testing positive for the first time break down by year and by age group. The age breakdowns are shown first in absolute numbers and in the second table as a proportion of all those with a first test in that year.

Table 8: Unique individuals testing positive for opiates-only or positive-for-both, by age and by year of first test.

Year of first test	Age 18-24	Age 25-29	Age 30-34	Age 35-39	Age 40 over	Total
2004	3,150	3,319	2,938	1,958	881	12,246
2005	2,391	2,832	2,548	1,791	977	10,539
2006	3,635	3,768	3,275	2,491	1,580	14,749
2007	3,182	3,359	2,869	2,178	1,803	13,391
2008	2,912	3,197	2,857	2,425	2,238	13,629
2009	2,711	2,594	2,304	1,998	2,048	11,655
2010	2,287	2,180	2,105	1,744	2,075	10,391
2011	1,772	1,519	1,622	1,274	1,726	7,913
2012	1,136	1,179	1,300	1,030	1,377	6,022
2013	721	850	938	704	1,068	4,281
Total	*23,897*	*24,797*	*22,756*	*17,593*	*15,773*	104,816

[14] Note that this rate is, in effect, the rate of arrest-and-testing-positive.
[15] The technical annex contains a section on exactly how this range was estimated.

Table 9: Table showing the age breakdown of individuals testing positive for opiates-only or positive-for-both as a proportion of all individuals first testing positive in that year.

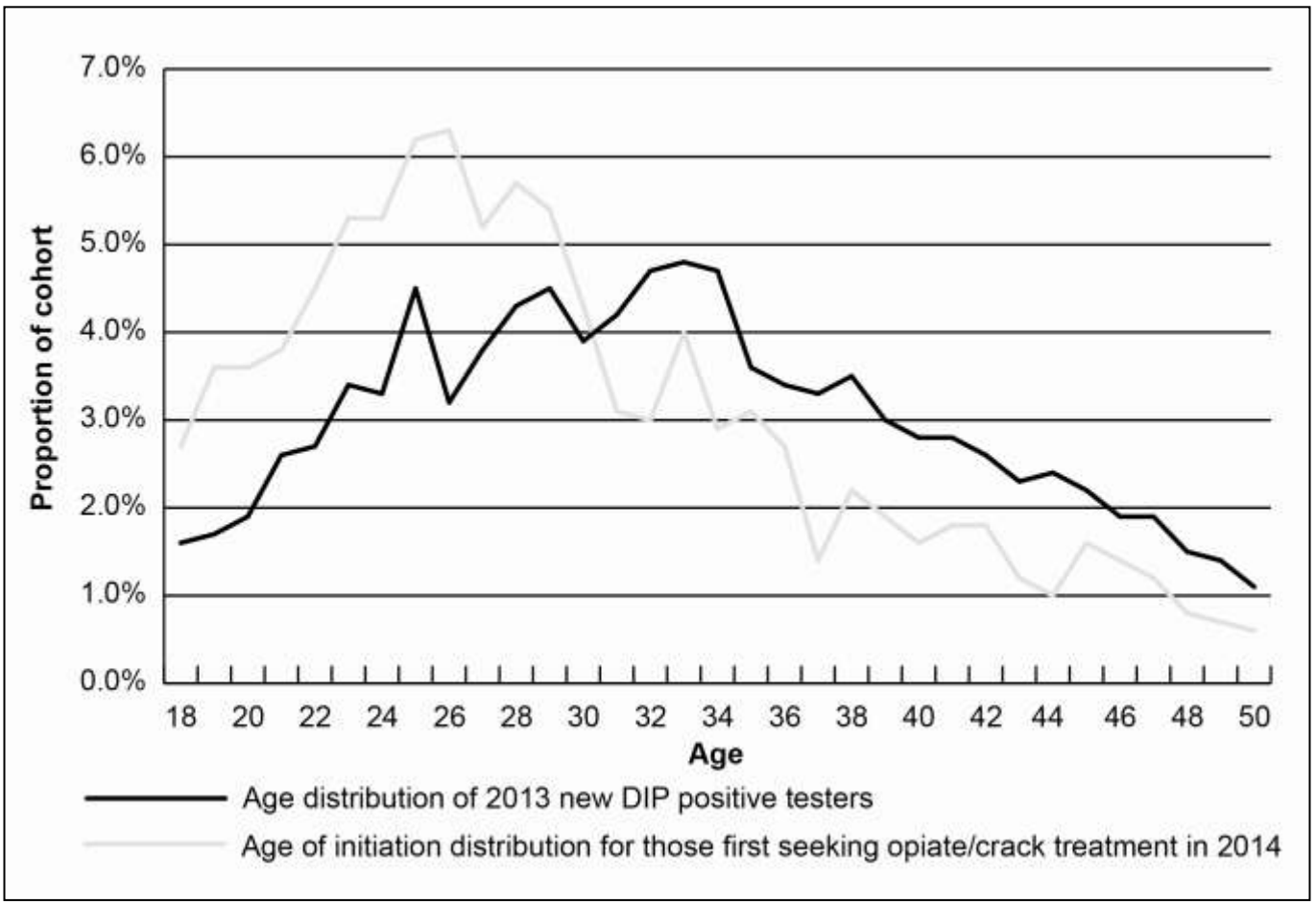
Year of first test	Age 18 - 24	Age 25 - 29	Age 30 - 34	Age 35 - 39	Age 40 over	Total
2004	26%	27%	24%	16%	7%	100%
2005	23%	27%	24%	17%	9%	100%
2006	25%	26%	22%	17%	11%	100%
2007	24%	25%	21%	16%	13%	100%
2008	21%	23%	21%	18%	16%	100%
2009	23%	22%	20%	17%	18%	100%
2010	22%	21%	20%	17%	20%	100%
2011	22%	19%	20%	16%	22%	100%
2012	19%	20%	22%	17%	23%	100%
2013	17%	20%	22%	16%	25%	100%

Comparing 2004 with 2013 shows that the younger age groups have seen falls in both the number and the proportion of new positive testers. However, the proportion of those aged 40+ has consistently risen and now constitutes the largest group of all new individuals testing positive.

This means that the 4,281 individuals testing positive for the first time in 2013 has a very different age profile to that we would expect from a cohort of recent initiates. It is far older, suggesting again that many of those are actually pre-existing users only tested (positively) for the first time in 2013. This adds further weight to the back-of-the-envelope modelling evidence demonstrating that a substantial proportion of the 4,281 new positive testers in 2013 are likely to be longer-term users who have only been first arrested in 2013, rather than genuinely new OCUs.

In the next section, analysis will examine whether there has been a possible shift towards an older profile amongst new initiates. But even taking this into account, it is unlikely that the majority of those 4,281 individuals are recent initiates. This can be seen clearly in Figure 8 below, which compares the age-of-initiation curve from Figure 11 (in the next section) to the 2013 ‘new-individuals’ cohort in the DIP data.

Figure 8: Comparison of new DIP and treatment cohorts, by age



The DIP cohort has a far older age profile even than the 2014 cohort of treatment initiates, who themselves have a far older age-of-initiation profile than previous treatment cohorts. As such, it seems highly unlikely that all, or even most, of the 4,281 positive testers in 2013 are new initiates.

Of course, even if just the small number of DIP testers (787[16]) who were aged under 25 in 2013 were considered to be new initiates, this would still need to be multiplied up by three factors to provide an estimate for total new initiates: i) the non-arrest rate (to account for the fact that only a proportion of crime-involved initiates will get arrested in a given year); ii) the fact that DIP's coverage (in terms of age, geography and PNC-referenced individuals) is not 100 per cent; iii) the likelihood that up to half of all new initiates will not be involved with crime at all. As an illustration, multiplying up 787 by these factors produces a figure close to 10,000.[17]

These calculations are speculative and based on a number of assumptions. They are intended as a sense-check on the results for the next section. The fragility of the modelling should not detract from the simple fact that the absolute number of new positive testers in 2013 is low relative to the estimated size of the total population. This alone suggests that numbers of new users in 2013 is markedly lower than in previous years.

[16] The figure in Table 8 is 721, but adjusting for the missing month of data this becomes 787.

[17] Assuming an arrest rate of 17% (see appendix), and that 50% of OCUs do not commit acquisitive crime (Gossop *et al*., 2003) and the coverage figures shown in the appendix.

2. Estimating an incidence trend from treatment data

This section uses treatment data from the National Database Treatment Monitoring System (NDTMS) to estimate the number of new OCUs annually. The NDTMS captures data on the numbers of people presenting to services with problem drug misuse and information about the drug treatment they receive. All drug treatment agencies in England provide a basic level of information to the NDTMS on their activities each month. The data for this report included all unique individuals presenting to treatment with opiates or crack-cocaine listed as their primary drug between 2005 and 2014. All individuals whose age of first use was listed as below ten or before 2005 were then excluded. Excluding individuals who started using opiates/crack before 2005 resulted in a large number of records being left out, due to the fact that the majority of the treatment population, even in 2013/14, initiated in the 1980s and 1990s when heroin and crack use surged in the UK. However, this exclusion is necessary for the incidence methodology, as explained later in this section. The remaining dataset included 52,829 individuals, as shown in Table 10.

Table 10: Descriptive statistics from the NDTMS data.

Reason for exclusion	Number of individuals excluded	Total number of individuals analysed
Initial sample prior to exclusion	0	243,588
No age at first use recorded or age was below 10 or higher than age at first treatment	443	243,145
Year of first use before 2005	190,316	52,829
Percentage of total sample initiating 2005–14	n/a	21.7%

The majority of those presenting for treatment between 2005 and 2014 started using opiates/crack before 2005 (around four in five). Only 52,829 individuals said they had an opiate/crack initiation date between 2005 and 2014. This suggests an average of just under 5,000 new starters per year during this period. But this would be an under-estimate of incidence because it is likely that some of those who began use between 2005 and 2014 would not yet have come to treatment during that period.

To correct for this, we use two variants of a methodology employed by researchers in Millar *et al*. (2001) and Hickman *et al*. (2001). These papers discuss the methodology in detail.

In brief, the method uses the lag-to-treatment distribution for the sample coupled with the number of new treatment presentations in a given year to estimate OCU incidence in that year. So, when presenting to treatment, all individuals are asked to provide the year in which they first began using their primary drug, which for this analysis was limited to opiates and/or crack-

cocaine. From this information it is possible to create a distribution, for all presentations, of the lag-time between initiation and their first presentation at treatment. This might show – for example – that only ten per cent of all individuals presenting to treatment do so in the first year of use, but that 25 per cent present within two years, and so on. This means that for each year, we can estimate the number of individuals who have begun an opiate-crack career *but who have yet to come to treatment*. Adding these to the numbers who began in that year and have come to treatment gives our total incidence estimate for each year.

The first model uses NDTMS data for the cohort starting use in 2005 (n=8,960), the lag-time distribution for those initiating use in 2005 and presenting to treatment between 2005 and 2014[18] is shown below.

Table 11: Time-to-treatment distribution for those initiating use in 2005 and presenting to treatment between 2005 and 2014.[19]

Lag time to treatment (years)	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10
Percentage	15%	17%	17%	14%	10%	9%	6%	5%	4%	4%
Cumulative percentage	15%	31%	49%	62%	73%	82%	88%	92%	96%	100%

Table 11 shows that 15 per cent of the individuals who started use in 2005 and had presented for treatment by 2014, presented within one year of initiation. A further 17 per cent presented between one and two years after initiation, prior to coming to treatment, meaning that overall 31 per cent of the sample said they came to treatment within two years of first using opiates/crack. (The fact this is not 32% is simply due to rounding).

As a basis for the total lag-to-treatment distribution, the main limitation with the above analysis is that it assumes all individuals coming to treatment do so within ten years. Examining data from earlier cohorts suggests this is inaccurate, as a small proportion of OCUs will continue to use these drugs for a long time, sometimes two decades or more, before seeking treatment, and some never will. However, we cannot use an earlier cohort for the distribution because this is equivalent to using out-of-date data. The average lag-to-treatment is likely to have reduced over time given the expansion of treatment places and the influence of DIP. Using old data will miss this and bias the estimates. Even using the 2005 cohort's distribution contains the assumption that the time-to-treatment lag has not altered significantly between 2005 and 2013/14. So, to try and obtain the most accurate model, we used the figures from the 2005 cohort for the first ten years, as above, on the basis that this covers the majority of individuals and for that we want the most up-to-date data possible whilst maintaining a long enough time period. We then index the trend at that point to an older cohort, and use data from that cohort to model the 'tail' of the distribution – i.e. those who take longer than ten years to reach treatment.[20] The result is a 20-year lag-to-treatment distribution, shown in Table 12 below.

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[18] Data for 2014 was available until October 2014. This was converted to annual figures by multiplying up by 1.2 to account for the missing months in a linear fashion.

[19] The percentages from this table can be calculated from the numbers in Table 13.

[20] In reality there is always a trade-off in this methodology between the up-to-dateness of the cohort used to measure the lag-to-treatment and the number of years of lag measured, i.e. we could use a more recent cohort, say 2008. But that would mean excluding all those who take longer than seven years to come to treatment, an even larger proportion. We are indebted to Tim Millar for providing the dataset used to model the 'tail' of the distribution. It contained a longer time series of

Table 12: Estimated 20-year lag-to-treatment distribution for model one

Lag time to treatment (years)	0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	19-20
Percentage	12%	14%	15%	12%	9%	8%	5%	4%	4%	3%	3%	1%	2%	1%	2%	1%	1%	1%	0%	1%
Cumulative percentage	12%	27%	41%	53%	62%	70%	75%	79%	82%	85%	88%	90%	92%	93%	95%	96%	97%	98%	99%	100%

The cumulative percentages from the table above can then be combined with statistics showing actual numbers of first presentations to treatment by year of onset to calculate an incidence trend, as demonstrated in Table 13.

Table 13: Table showing the data used to estimate incidence in model one and the results[21]

		Year of 1st treatment													
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	Total	Percentage of total incidence accounted for by observed	Estimated number yet to come to treatment	Estimated total incidence
Year 1st use	2005	1,305	1,508	1,533	1,250	938	800	512	408	376	330	8,960	85%	1,523	10,483
	2006	-	1,297	1,727	1,624	1,116	821	611	471	470	358	8,495	82%	1,824	10,319
	2007	-	-	1,482	1,906	1,532	1,020	671	566	491	416	8,084	79%	2,183	10,268
	2008	-	-	-	1,446	1,857	1,456	840	659	570	424	7,252	75%	2,437	9,689
	2009	-	-	-	-	1,580	1,811	1,018	727	627	527	6,290	70%	2,701	8,990
	2010	-	-	-	-	-	1,404	1,101	933	757	544	4,739	62%	2,864	7,602
	2011	-	-	-	-	-	-	1,001	1,109	988	646	3,744	53%	3,269	7,013
	2012	-	-	-	-	-	-	-	967	1,149	920	3,036	41%	4,287	7,324
	2013	-	-	-	-	-	-	-	-	1,021	1,204	2,225	27%	6,065	8,290
	2014	-	-	-	-	-	-	-	-	-	869	869	12%		
Total		1,305	2,805	4,742	6,226	7,023	7,312	5,754	5,840	6,449	6236.4	53,693			

Reading down the year columns, the table shows that of the 6,449 people who presented for opiate/crack treatment for the first time in 2013, 376 said they had begun using in 2005. Another 470 said they started using in 2006, and so on.

Reading across the table shows that of all those who said they began using opiates/crack in 2005 (8,960), 1,305 also presented to treatment for the first time in that year (which is 15 per cent of the observed cohort from Table 11 and 12 per cent of our estimated total cohort from Table 12). Another 1,508 presented for the first time a year later, and so on. The first number in the totals column (8,960) therefore represents all individuals who said they began using in 2005. It is therefore the 'observed' incidence level. The column to the right of this is the cumulative percentages from the estimated lag-to-treatment distribution in Table 12. This shows the

otherwise similar data (i.e. first treatment presentation and year of initiation) from OCUs attending treatment in the Manchester area.

[21] Note that the data for 2014 only includes Jan–Oct as this was all that was available. Hence we do not do not attempt to calculate an incidence estimate for 2014 and we adjust all the values in that column by multiplying by (12/10) to account for the missing months.

estimated percentage of the total incidence captured by the observed incidence. In other words, our lag-to-treatment distribution suggests that of the 8,960 individuals who began use in 2005, 85 per cent will have come to treatment by 2014; so by adding the other 15 per cent on (1,523), we reach our estimated total incidence for that year: 10,483.

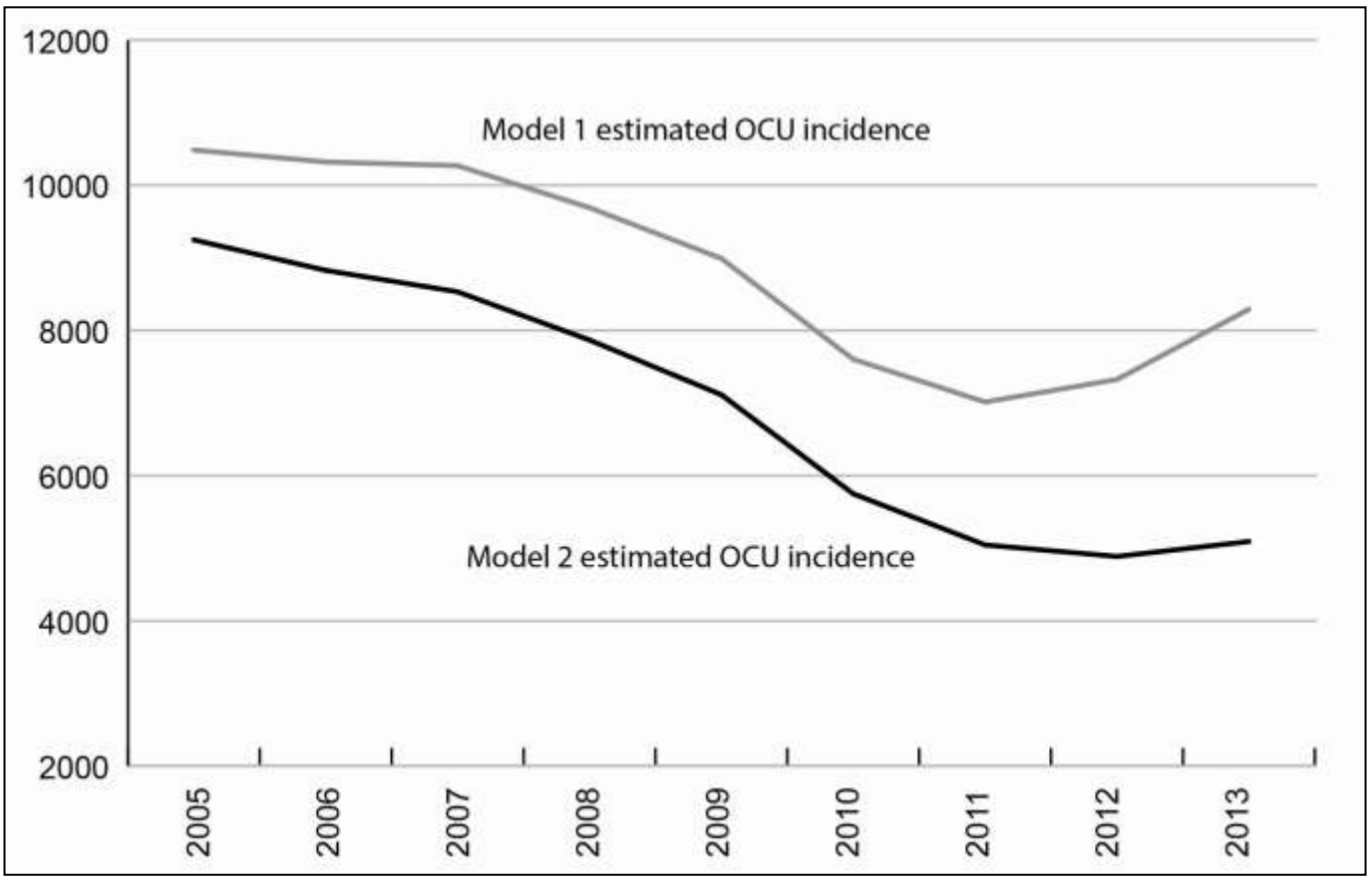
The second model uses the same principles but instead of looking only at the lag-to-treatment distribution for the 2005 cohort (i.e. the top row of Table 13), it incorporates available lag-to-treatment data from all new presentations between 2005 and 2014 (i.e. all rows in Table 13). This is done by calculating the total number of individuals within the sample who have a lag-to-treatment of a year or less, the total number with a lag of 1-2 years and so on. By comparing these numbers with the total number of individuals within the sample who *could* have come to treatment with that length of lag or less, it is possible to produce a 10-year lag-to treatment distribution, which is similar to Table 11 except uses data from the whole sample. (The mathematical calculations for this are set out in the appendix of Hickman *et al*., 2001). As before we then index the trend to the older cohort to model the tail of the distribution and use the results to calculate incidence in an identical way to the first model. The results are shown in Table 14 below, which is a slimmed-down version of Table 13, showing the only column that has changed (the one headed `percentage of total incidence accounted for by observed') and the impact this has on resulting incidence (in the final column.) One of the important differences between the methods is that method 2, which incorporates all the data from the 2005-14 sample has a much shorter lag to treatment overall, which suggests that lag-times have generally reduced since 2005.

Table 14: Results of model two

Year of first use	Observed	Percentage of total incidence accounted for by observed	Estimated number yet to come to treatment	Estimated total incidence
2005	8,960	97%	286	9,246
2006	8,495	96%	332	8,826
2007	8,084	95%	447	8,531
2008	7,252	92%	615	7,867
2009	6,290	88%	823	7,113
2010	4,739	82%	1,010	5,749
2011	3,744	74%	1,301	5,045
2012	3,036	62%	1,849	4,886
2013	2,225	44%	2,868	5,092

The incidence estimates from the two models are shown in Figure 9.

Figure 9: Estimated incidence trend, 2005–2013.



Before discussing the trend implied by this chart, it is important first to sense-check the general level of new users implied. Analysis from the previous section suggested that the number of new OCUs for 2013 was unlikely to be much higher than 10,000 with only a proportion of those involved with crime. The 2013 estimate implied by Model 1 is 8,290 and for Model 2 it is 5,092, so both are in line with the earlier analysis. The NDTMS data only covers England, not England and Wales, and our estimates will of course miss any OCUs who *never* come to treatment. Hence the estimates for both models may be slightly conservative in that sense. But putting all the partial evidence together, it can be said with a degree of certainty that the total number of individuals who begin using opiates or crack-cocaine each year is probably not markedly higher than 10,000, and that fewer than half of these are likely to be involved in significant amounts of acquisitive crime.

To put this into historical context, an incidence rate of 10,000 works out at a rate of 0.18 individuals per 1,000 population. Published estimates of incidence in Manchester during the epidemic period of the late 1980s and early 1990s included rates above two per 1,000 population, i.e. more than 11 times higher (Millar *et al*., 2001).

Turning to the trend implied by Figure 9: both models imply that numbers of new OCUs in 2013 are lower than in 2005. Model 1 implies that they have fallen by around a fifth during that period and Model 2 suggests a fall of around 45%. But secondly, the way the methodology works means that the most recent years are the least reliable because they use the least amount of data. This is why the distance between the estimates from the two models widens for the more recent years. It means that it is difficult to say for certain whether the period of flattening from 2011 onwards, which occurs in both estimated trends but is more obvious in Model 1, is a blip in an otherwise downward trend or the start of a turning point. Either way, a flattening of the trend

between March 2011 and March 2015 can also be seen in the raw numbers for total new OCU treatment presentations.[22]

Figure 10: New treatment presentations for opiate/crack use.

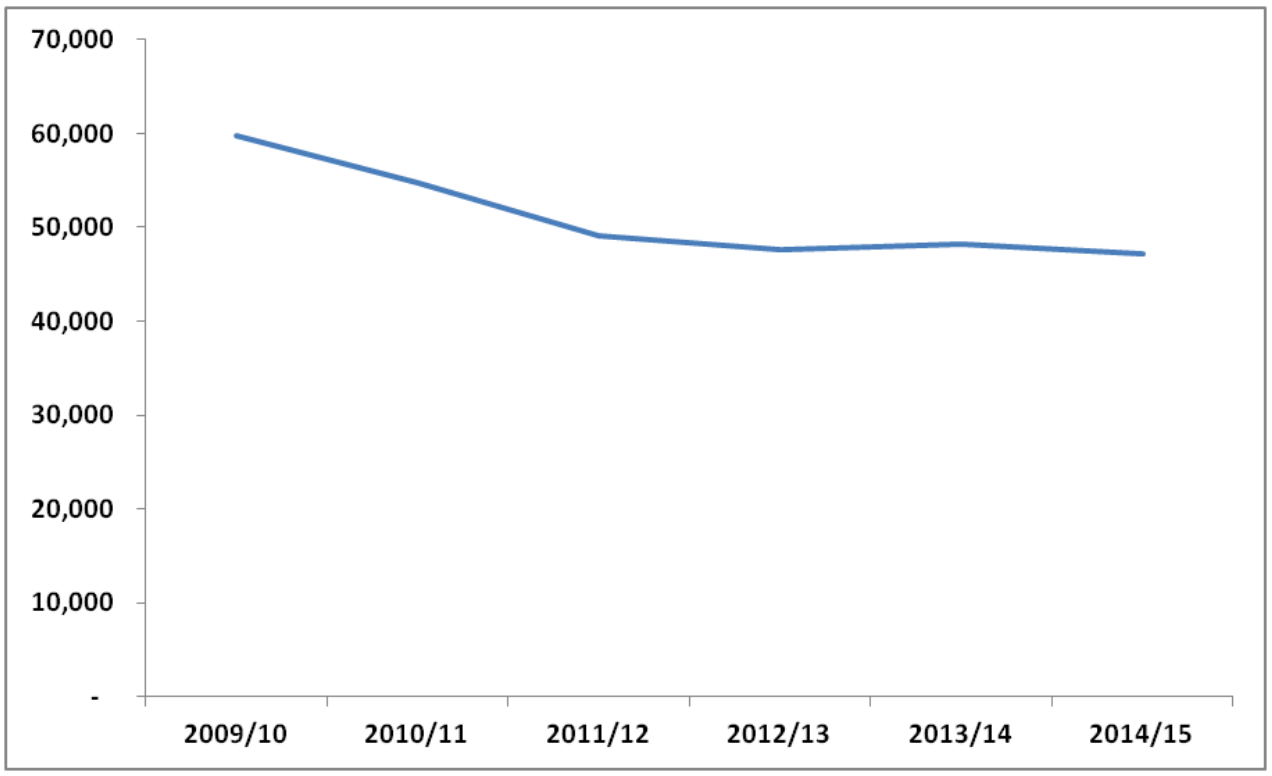


Figure 10 shows that, rather than increasing in the current year, new presentations for opiate/crack use have actually fallen slightly from 48,154 in 2013/14 to 47,241 in 2014/15, a decrease of 1.9%. However, given that the early signs of previous opiate/crack use epidemics have been missed before (see Morgan, 2014), and the potential social harm that a fresh increase in new OCUs could cause, further analysis was conducted on the most recent data to try and determine whether the apparent flattening in trends was actually caused by the early stages of a significant surge in new users.

The treatment data was broken down by age to check whether the slight fall in total new presentations in 2014/15 masked an increase in younger treatment presentations. This showed instead that opiate/crack presentations by those aged 18-24 had fallen from 3,579 in 2013/14 to 3,021 in 2014/15, a fall of 15.6%. In other words, younger new presentations have fallen at a faster rate over the last year than for those aged over-25. Furthermore, separate statistics produced for those in treatment aged 18-and-under also show a fall in aggregate numbers in treatment for opiates and crack.

We also looked at trends at the local level, given that previous epidemics have started in very specific areas and have taken several years to spread nationally. This means that the start of an epidemic can be hidden in the national data because it has not reached enough areas to register.

[22] Note that this series counts the start of any new treatment journey, regardless of whether an individual has been in treatment before. So unlike our definition of 'new' elsewhere it includes individuals who have been to treatment previously.

The analysis showed that of the 149 Drug Action Team areas in England, 72 per cent had decreases in new OCU treatment numbers in the year to September 2014 compared to the previous year. Furthermore, of the 42 areas showing an increase, only 11 also showed a rise for the 12 months to September 2010 compared with the 12 months to September 2014, and most of these involved small numbers of individuals.

Overall then, the very recent data on treatment presentations do not currently suggest that the number of new OCUs is on the verge of increasing, merely that it flattened for a period.

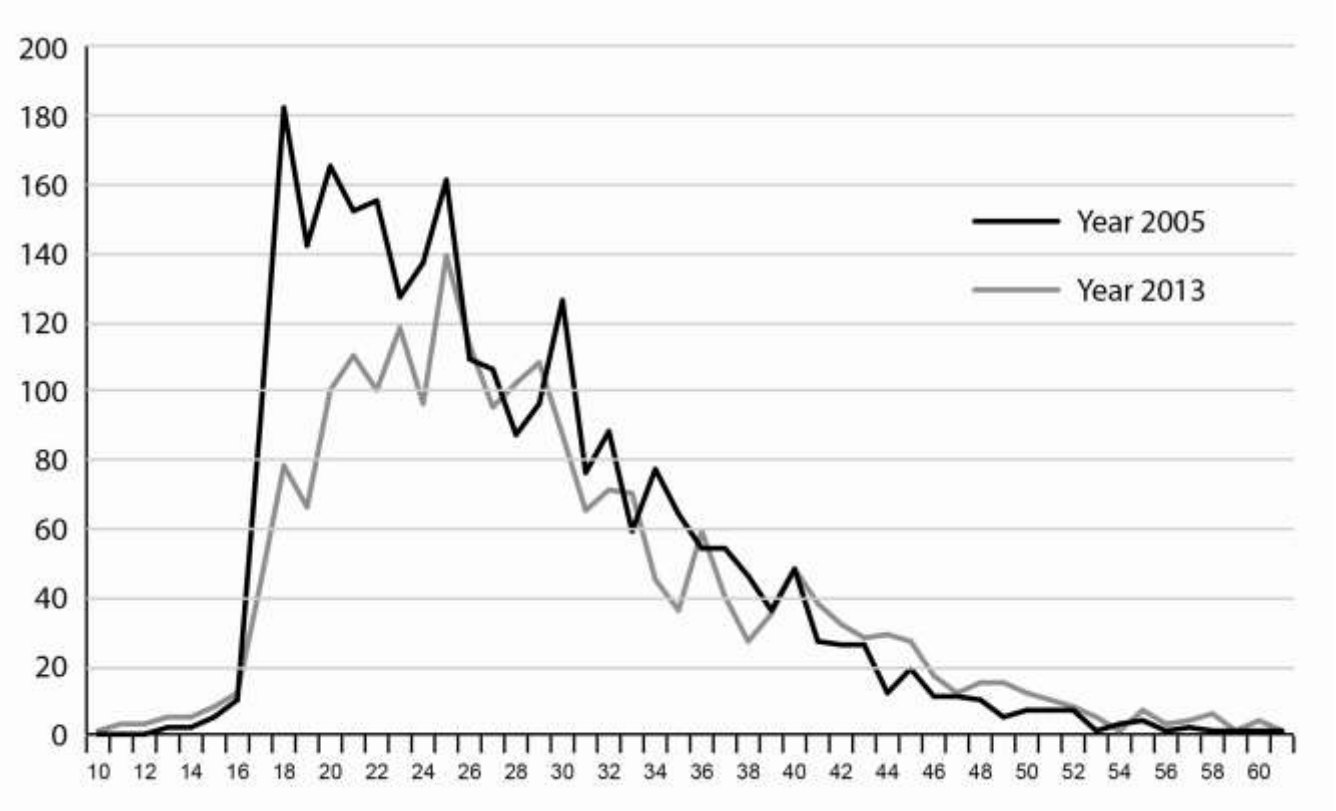
A number of factors could explain the flattening. Most importantly, if there was some sort of shock that caused a one-off reduction in the lag-time to treatment this could make it appear as if incidence was rising when in fact new users may be falling but a greater percentage may simply be turning up to treatment faster. Such a shock may have occurred given the reduction in heroin supply seen from the end of 2010 through to 2012 (see Ahmad *et al*,. 2016). If users unable to obtain heroin used this enforced abstinence as a spur to seek treatment and hence to present to treatment services earlier than they otherwise would have done, this could cause a one-off 'concertina effect' in which treatment numbers initially flatten or even rise but then fall again. This would also explain why the downward trend has apparently resumed: evidence suggests the reduction in supply has also ended.

However, further analysis revealed some other possibilities based on the characteristics of those attending opiate/crack treatment for the first time in recent years. The Appendix includes a series of graphs with age-of-onset distributions for those who first attended treatment in 2013, and then 2012, and so on back to 2004. These show that the majority of those who presented to treatment in 2004 initiated use in the mid-1990s in line with the likely peak of the epidemic. But by 2012 a far greater number of individuals presenting to treatment say they started using opiates/crack only a year or two before.[23] In other words, there appears to be a shift towards a shorter lag between initiation and treatment. This shift looks even more dramatic when using proportions rather than absolute numbers, see the Appendix.

Furthermore, these individuals (those who seem to have both initiated recently *and* presented to treatment within a year or two of initiation) show a notably different age-of-initiation profile compared to the established profile in the literature, which peaks around 18–22 (Donmall & Jones, 2005). These individuals have a notably older age profile: see figure 11 chart, which compares recent initiates who presented to treatment in 2005 with recent initiates who presented to treatment in 2013.

[23] This shift does not appear to be related to the reduction in heroin supply occurring around 2010/11. As Appendix 1 demonstrates, the pattern emerges far earlier.

Figure 11: Number of recent (within two years) OCU initiates presenting to treatment in 2005 and 2013, by age of individual at first presentation.



The mode age of initiation has shifted from around 18 to around 25 and there is an older age profile throughout. Rises in average age of initiation have also been reported recently in cohorts of Australian injecting drug users (Horyniak et al., 2015). There appear to be two possible explanations.

- There is a genuine shift towards new initiates being older, and for them to present to treatment much faster than in previous years.

- There is a consistent, but small number of individuals who mis-report their age of onset when attending treatment i.e. who report that they have only been using opiates/crack for a short period when in fact they have been using for a far longer period, and that this is starting to really bias the numbers for recent cohorts because attendees from the original epidemic are becoming smaller.

It is possible then that the flattening we observe in the incidence trend is due to a small in-flux of older initiates, although mis-reporting may also explain that phenomenon. Either way though, as this analysis has made clear throughout, absolute numbers of new OCUs appear to be small – probably fewer than 10,000 per annum and the numbers of those involved with crime will be smaller still. In addition, despite a flattening in the probable trend in new users, there is currently no sign that it is likely to tip upwards. If anything, the data suggest the downward trend is set to resume, though clearly it remains important to monitor the situation.

Conclusion

This report has attempted to draw together available data and evidence to estimate the number of new opiate/crack-cocaine users (OCUs) per year in England since 2005 and then to look briefly at their characteristics. This is important as previous research has suggested that – mostly through the actions of a minority - this group has the potential to have a large impact on crime trends and therefore to impose significant societal costs.

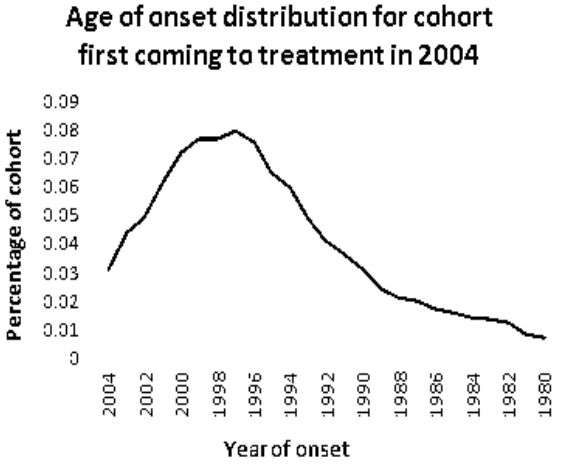
Though data on this population is imperfect, a number of different data sources and methodologies are available to estimate OCU incidence. From these, three key conclusions emerge:

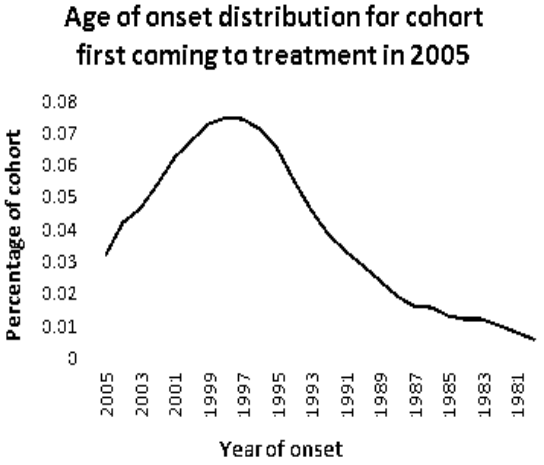
- The number of new opiate/crack users is clearly far lower now than it was in the 1980s and early 1990s and has even dropped 20-45% since 2005.
- This means numbers of new users in 2013 may be around 5,000-8,000 with an approximate upper bound of 10,000; and numbers involved with prolific criminality will be lower still.
- The downward trend in new OCUs has flattened since about 2011, but available data do not suggest that this is the precursor to a new increase. If anything, the downward trend may resume in 2014, though the situation requires further monitoring.

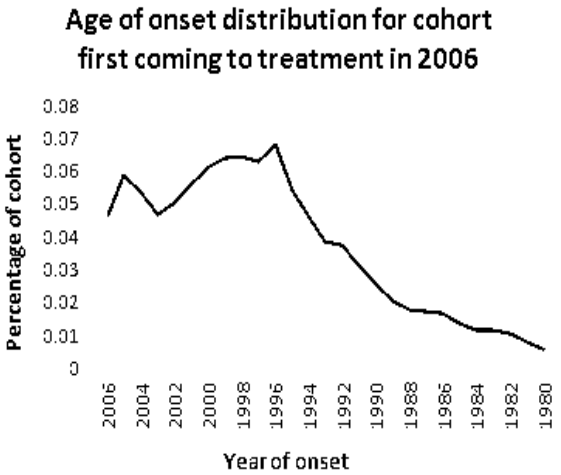
For local areas then, this report suggests that it is still important to identify new OCUs as the arrestee data showed that a proportion of these are likely to offend over a long period of time. But also, there was some evidence of a shift to older initiates, which may require a slightly different treatment approach.

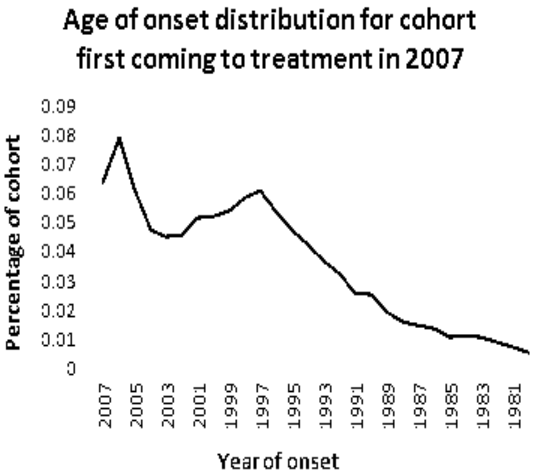
Appendix

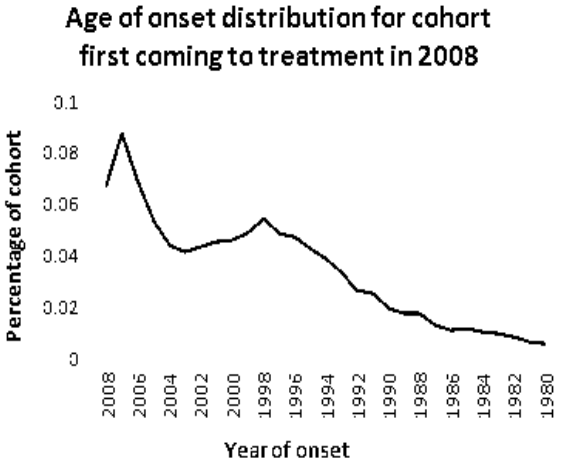
Charts showing age-of-onset distributions (by percentage of total cohort) for different cohorts based on year of first treatment

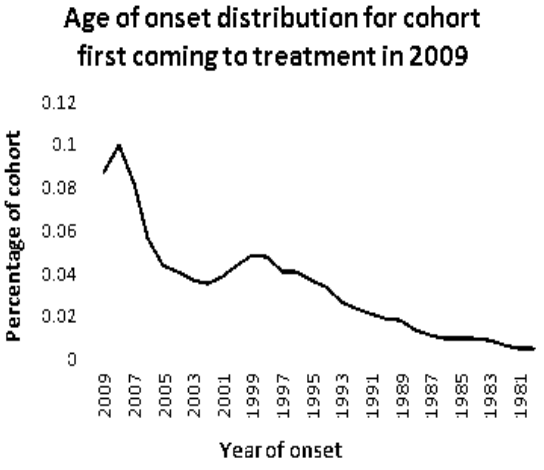


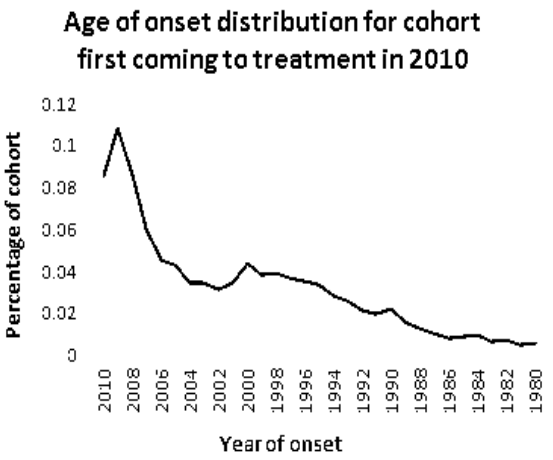


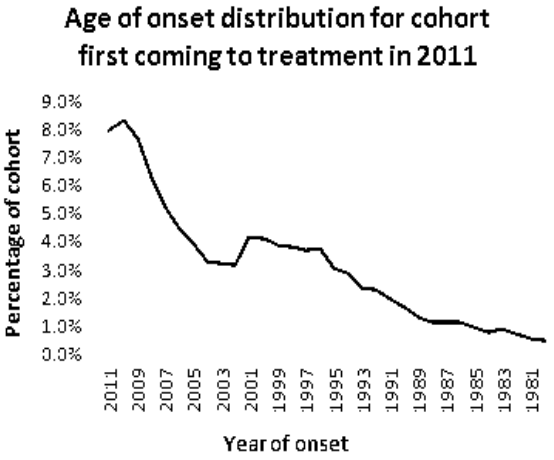









Age of onset distribution for cohort first coming to treatment in 2010
Percentage of cohort
0.12
0.1
0.08
0.06
0.04
0.02
0
2010 2008 2006 2004 2002 2000 1998 1996 1994 1992 1990 1988 1986 1984 1982 1980
Year of onset


Age of onset distribution for cohort first coming to treatment in 2011
Percentage of cohort
9.0%
8.0%
7.0%
6.0%
5.0%
4.0%
3.0%
2.0%
1.0%
0.0%
2011 2009 2007 2005 2003 2001 1999 1997 1995 1993 1991 1989 1987 1985 1983 1981
Year of onset

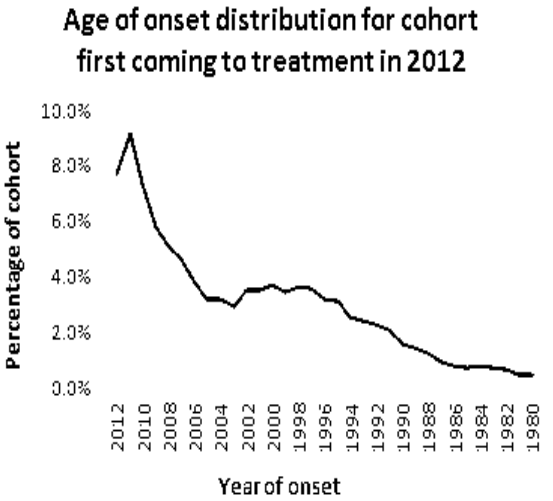
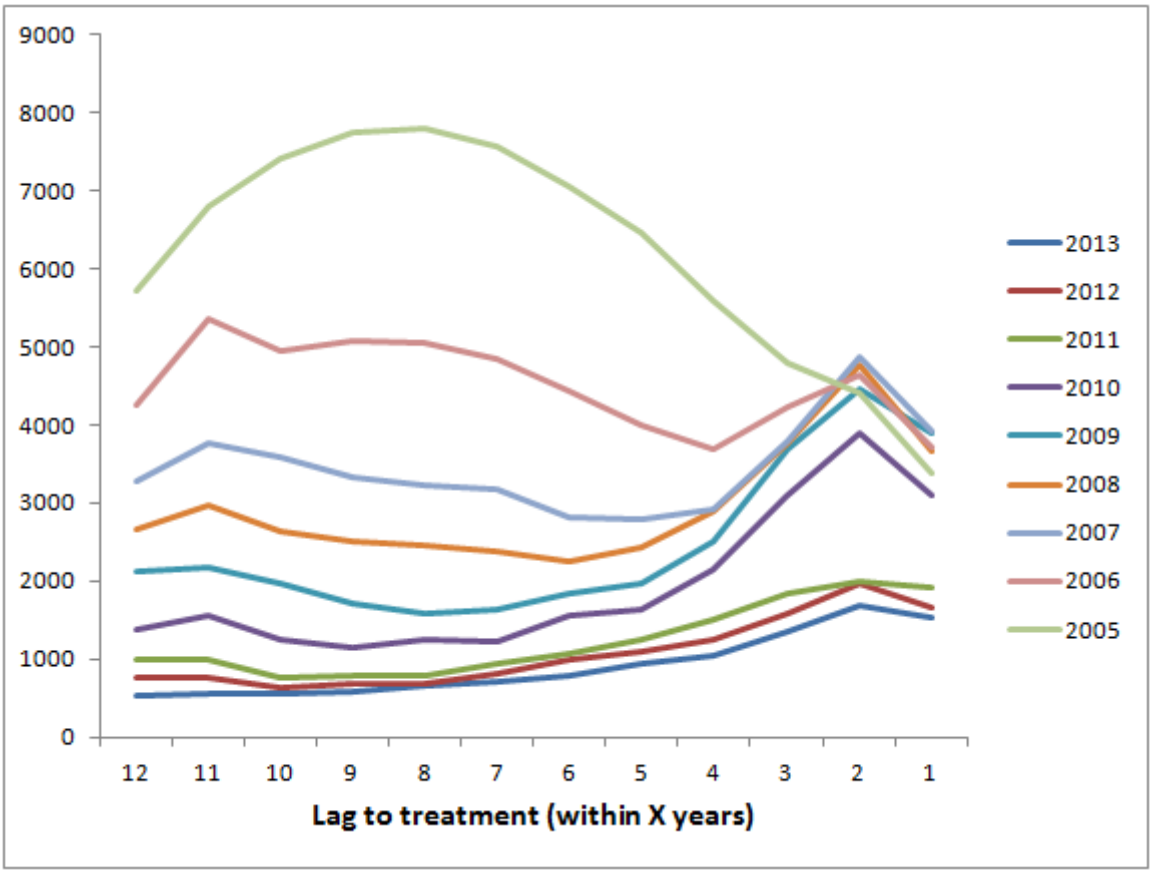

Age of onset distribution for cohort first coming to treatment in 2012
Percentage of cohort
10.0%
8.0%
6.0%
4.0%
2.0%
0.0%
2012 2010 2008 2006 2004 2002 2000 1998 1996 1994 1992 1990 1988 1986 1984 1982 1980
Year of onset

Chart showing lag-to-treatment distribution (in absolute numbers) by year of first treatment presentation



The coverage of the DIP data

The DIP data will not capture all OCUs for several reasons.

i) It is predicated on arrest or charge, so OCUs who do not commit crime will not be captured in the data.
ii) Data are not available for all months in each year – data for 2013 are only available for the first 11 months of that year.
iii) Its geographical coverage is not 100 per cent and varies across the period in question.
iv) The data do not cover all ages. DIP tests are given to those aged 18 and over only (and we excluded those over 60 for various reasons).
iv) Other factors, like data-entry error. In particular, the exclusion of those without an entry on the Police National Computer (PNC) will affect DIP coverage.

This section tries to assess the seriousness of these issues when interpreting the DIP data and drawing conclusions. Regarding the first and fourth points, it is clear that the DIP data presented in this report are only informative about a subset of OCUs, those who commit crime and are aged between 18 and 59, and all inferences from the data must reflect this. Point ii) has been dealt with throughout the paper by adjusting 2013 figures in a linear fashion to account for the missing month. This also needs to be borne in mind when interpreting the findings.

The impact of point iii) is perhaps the largest potentially and also the most important in terms of validation of conclusions, hence we explore its effect further here, along with point v).

DIP data are available by LAA (Local Authority Area). There are 148 of these across England and as the table below makes clear, all submitted some DIP data at some point between 2004 and 2013. However, a quick glance through the table also reveals that many LAAs only submitted data for certain years.

Annual number of DIP tests recorded by each LAA, 2005 to 2013[24].

[24] The total here does not include, LAAs outside of England, or cases where no LAA was recorded. It will therefore not sum to the 296,008 tests given in other tables.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	Total
Leeds (DAT)	*	2892	1745	1817	1627	1268	989	757	208	11,306
Birmingham (DAT)	*	1228	993	1314	1224	1463	1395	1300	1071	9,988
Manchester (DAT)	158	1623	1555	1583	1289	958	558	434	297	8,455
Liverpool (DAT)	8	600	1029	1419	1270	1238	923	794	689	7,970
Bristol (DAT)	*	*	962	1547	1372	1211	803	769	642	7,309
Bradford	*	562	1228	1252	1082	1240	881	766	160	7,171
Nottingham (DAT)	95	1404	1389	1152	1040	1050	465	352	202	7,149
Sheffield	105	1370	1306	1018	857	665	529	422	319	6,591
Doncaster (DAT)	76	1006	1029	1017	877	691	620	632	460	6,408
Nottinghamshire	92	1123	1291	970	613	621	656	446	250	6,062
Kingston Upon Hull	*	638	786	794	850	834	787	631	534	5,854
Newcastle upon Tyne	*	538	663	584	658	636	445	460	325	4,309
Wakefield (DAT)	*	308	744	722	586	654	465	306	84	3,870
Leicestershire	*	329	411	713	766	672	378	336	231	3,837
Wirral	*	405	489	689	603	548	431	339	311	3,815
Middlesbrough	*	432	626	661	568	670	406	313	108	3,784
Ealing	*	381	452	437	494	527	433	479	344	3,547
Kirklees	*	252	699	595	540	575	419	301	63	3,444
Hartlepool	*	310	465	558	550	551	495	331	156	3,416
Bolton	55	660	597	705	484	417	227	170	92	3,407
Leicester (DAT)	*	381	481	493	468	542	348	366	246	3,325
Wolverhampton	*	393	324	460	358	493	452	450	313	3,243
Reading (DAT)	*	387	579	539	488	567	390	189	95	3,234
Rotherham	57	612	567	500	416	366	244	234	226	3,222
Walsall	*	414	442	489	374	458	338	399	245	3,159
Tower Hamlets	*	30	248	737	497	455	417	340	334	3,058
Stockton-on-Tees	*	250	446	532	497	526	318	266	140	2,975
Barnsley	75	666	425	404	394	355	239	210	158	2,926
Coventry	*	295	223	349	421	566	390	333	255	2,833
Newham	*	175	335	452	404	431	323	284	382	2,786
Sunderland	*	304	377	409	530	391	327	227	148	2,713
Peterborough	*	258	185	417	530	558	349	203	100	2,600
Camden	*	334	406	438	355	338	329	232	157	2,589
Tameside	30	287	490	402	376	345	285	181	152	2,548
North East Lincolnshire	*	286	419	430	354	348	310	211	186	2,544
Gateshead	*	335	378	387	356	398	283	203	180	2,520

Oxfordshire	*	333	414	409	391	366	221	129	128	2,391
Sandwell	*	283	286	345	248	414	299	229	224	2,328
Rochdale	40	432	515	401	268	257	157	133	95	2,298
Wigan	35	452	317	245	276	284	277	213	119	2,218
St Helens	*	7	129	387	432	440	293	239	206	2,133
Dudley	*	272	199	328	263	354	253	229	202	2,100
Oldham	38	379	281	327	259	316	175	141	110	2,026
Slough	*	343	337	288	278	298	280	74	47	1,945
Sefton	*	120	154	436	319	239	206	175	192	1,841
Salford	19	337	305	278	238	307	124	126	62	1,796
Calderdale	*	141	329	260	241	332	219	171	41	1,734
Brent	*	155	169	275	281	250	207	173	161	1,671
Bedford UA Area	*	100	143	189	331	342	232	174	141	1,652
Southwark	*	66	147	321	169	245	212	212	196	1,568
Lambeth	*	278	342	278	133	61	71	146	167	1,476
Blackpool	*	6	5	*	279	469	346	285	62	1,457
Greenwich	*	138	162	267	258	286	135	97	60	1,403
North Lincolnshire	*	128	217	204	187	193	177	130	93	1,329
Bury	13	237	238	185	180	164	108	95	108	1,328
Lewisham	*	86	48	299	227	217	117	156	157	1,307
Islington	*	96	34	145	200	208	193	229	198	1,303
Stockport	29	228	164	190	195	193	124	83	61	1,267
Luton	*	11	6	291	205	242	192	193	110	1,250
Haringey	*	19	131	221	238	204	129	144	133	1,219
Redbridge	*	30	93	155	152	196	211	157	155	1,149
Enfield	*	8	69	222	153	187	161	183	164	1,147
Hammersmith and Fulham	*	31	48	108	193	196	179	160	171	1,086
Croydon	*	20	99	265	243	129	68	100	152	1,076
Hackney	*	18	41	190	220	186	66	183	147	1,051
Northamptonshire	*	29	25	138	201	230	112	116	123	974
Solihull	*	118	114	113	78	126	144	131	106	930
Wandsworth (DAT)	*	11	63	163	133	132	111	141	125	879
Waltham Forest	*	9	33	87	124	159	169	152	145	878
Staffordshire	*	152	274	163	13	19	33	98	87	840
Redcar and Cleveland	*	31	102	137	116	99	211	111	29	836
Knowsley	*	25	81	189	138	146	72	52	67	771
Hounslow	*	43	54	47	67	70	52	147	281	761

Trafford	8	139	130	121	76	108	55	39	28	704
Stoke-on-Trent	*	*	7	*	*	*	61	371	222	669
Hillingdon	*	50	73	77	69	68	74	98	133	642
Windsor and Maidenhead	*	*	42	61	149	123	99	34	24	536
Westminster	*	64	69	96	48	31	35	110	64	517
East Sussex	*	*	*	*	*	*	135	156	181	485
Kent	*	17	23	48	16	32	20	154	175	485
Kensington and Chelsea	*	16	40	52	90	95	61	65	50	469
Surrey	*	14	24	41	40	24	37	110	172	462
Barking and Dagenham	*	14	33	65	49	60	60	35	124	440
East Riding of Yorkshire	*	34	40	48	59	83	67	44	31	406
Lancashire	*	35	26	24	36	75	96	74	29	395
Wokingham	*	*	28	65	83	105	56	20	9	369
Derbyshire	*	77	49	51	36	40	38	27	21	343
Essex	*	13	32	52	47	51	44	45	52	336
Bracknell Forest	*	11	29	33	85	75	46	26	23	328
Suffolk	*	*	*	*	*	*	*	116	197	323
North Tyneside	*	54	87	51	54	17	11	18	12	304
Harrow	*	19	27	53	42	31	29	29	66	296
Devon	*	103	114	21	*	*	*	*	*	248
Lincolnshire	*	31	26	47	40	28	28	26	18	246
County Durham	*	28	20	41	24	39	36	20	19	227
Barnet	*	11	26	28	26	19	22	34	58	224
Bromley	*	6	10	37	23	19	12	20	80	207
Hertfordshire	*	9	15	21	19	17	34	26	50	191
Havering	*	7	13	19	15	17	17	9	80	177
South Tyneside	*	27	27	22	43	11	14	11	*	158
Cheshire	*	20	26	29	22	16	18	13	11	156
Buckinghamshire	*	9	6	15	23	19	25	35	21	153
Richmond upon Thames	*	*	*	9	9	5	36	38	46	148
Northumberland	*	16	18	21	37	10	11	8	16	137
Warwickshire	*	10	18	20	8	11	26	20	18	131
Worcestershire	*	*	5	6	*	*	12	39	60	129
Shropshire	*	*	6	12	*	7	10	37	49	124
Somerset	*	*	*	*	*	*	*	13	101	122
West Berkshire	*	*	7	14	18	7	11	8	53	121

Cambridgeshire	*	19	12	22	20	14	13	9	9	118
Bexley	*	13	6	25	10	15	5	*	38	115
Sutton	*	*	5	9	*	*	5	6	80	115
Milton Keynes	*	*	*	*	8	*	7	27	51	102
Kingston upon Thames	*	*	*	*	10	*	6	5	65	95
Merton	*	*	*	10	*	7	7	11	40	84
Hampshire	*	8	*	22	11	10	6	10	6	76
Derby	*	12	15	10	11	13	5	*	*	75
Telford and Wrekin	*	*	*	10	*	*	*	15	38	73
City of London	*	*	11	14	13	12	*	*	*	64
North Yorkshire	*	8	6	10	9	10	6	*	8	59
Bath and North East Somerset	*	*	7	5	*	*	*	*	35	58
Warrington	*	6	12	13	6	8	*	5	5	58
South Gloucestershire	*	*	13	5	*	*	*	10	26	55
Blackburn With Darwen	*	6	*	6	5	10	11	*	*	47
Darlington	*	11	8	8	*	7	*	5	*	47
York	*	7	5	12	*	*	*	9	*	47
West Sussex	*	*	*	*	*	6	*	6	6	32
Norfolk	*	*	*	*	5	*	*	*	11	31
North Somerset	*	*	5	*	*	*	*	6	13	26
Brighton and Hove	*	*	*	5	*	*	*	*	*	19
Cumbria	*	*	*	*	*	*	6	*	*	19
Herefordshire	*	*	*	*	*	*	*	*	*	19
Bournemouth	*	*	*	*	*	*	*	5	*	18
Portsmouth	*	*	*	6	*	*	*	*	*	18
Medway towns	*	*	*	*	*	*	*	*	8	16
Thurrock	*	*	*	*	*	*	*	7	*	16
Swindon	*	*	*	*	*	*	*	*	*	13
Wiltshire	*	*	*	*	5	*	*	*	*	13
Cornwall and Isles of Scilly	*	*	*	*	*	*	*	*	*	12
Southampton	*	*	*	*	*	*	*	*	*	12
Gloucestershire	*	*	*	*	*	*	*	*	*	11
Dorset	*	*	*	*	*	*	*	*	*	8
Halton	*	*	*	*	*	*	*	*	*	7
Southend-on-Sea	*	*	*	*	*	*	*	*	*	6

Isle of Wight	*	*	*	*	*	*	*	*	*	5
Plymouth	*	*	*	*	*	*	*	*	*	5
Poole	*	*	*	*	*	*	*	*	*	*
Torbay	*	*	*	*	*	*	*	*	*	*
Rutland	*	*	*	*	*	*	*	*	*	*
Total	953	27,626	32,208	37,074	33,542	33,598	25,440	22,487	17,467	230,395

* = value less than 5

Using the Hay *et al*. (2014) estimates for the total OCU population, it is possible to produce an estimate of the proportion of all OCUs who reside in each LAA area by dividing the point-estimates for each LAA by the total. The results of this are shown in the table below.

Proportion of the total opiate and cocaine using population covered by each individual LAA.

Proportion of estimated total OCU population covered by each Drug & Alcohol Action Team (DAAT)					
Barking and Dagenham	0.4%	Harrow	0.3%	Richmond upon Thames	0.2%
Barnet	0.5%	Hartlepool	0.3%	Rochdale	0.5%
Barnsley	0.6%	Havering	0.3%	Rotherham	0.6%
Bath and North East Somerset	0.4%	Herefordshire	0.2%	Rutland	0.0%
Bedford/Befordshire	0.6%	Hertfordshire	1.1%	Salford	0.5%
Bexley	0.2%	Hillingdon	0.4%	Sandwell	0.7%
Birmingham (DAT)	3.7%	Hounslow	0.4%	Sefton	0.6%
Blackburn With Darwen	0.5%	Isle of Wight	0.2%	Sheffield	1.5%
Blackpool	0.6%	Islington	0.9%	Shropshire	0.3%
Bolton	0.7%	Kensington and Chelsea	0.4%	Slough	0.4%
Bournemouth	0.6%	Kent	1.7%	Solihull	0.3%
Bracknell Forest	0.1%	Kingston Upon Hull	1.1%	Somerset	0.6%
Bradford	1.5%	Kingston upon Thames	0.2%	South Gloucestershire	0.3%
Brent	0.6%	Kirklees	0.9%	South Tyneside	0.3%
Brighton and Hove	0.7%	Knowsley	0.3%	Southampton	0.6%
Bristol (DAT)	1.8%	Lambeth	1.0%	Southend-on-Sea	0.4%
Bromley	0.4%	Lancashire	2.2%	Southwark	1.0%
Buckinghamshire	0.5%	Leeds (DAT)	1.9%	St Helens	0.4%
Bury	0.3%	Leicester (DAT)	1.0%	Staffordshire	1.1%
Calderdale	0.4%	Leicestershire	0.6%	Stockport	0.4%
Cambridgeshire	0.6%	Lewisham	0.8%	Stockton-on-Tees	0.6%
Camden	0.8%	Lincolnshire	1.0%	Stoke-on-Trent	0.8%
Cheshire East & West + Chester	1.1%	Liverpool (DAT)	1.8%	Suffolk	0.8%
City of London	0.0%	Luton	0.5%	Sunderland	0.4%

Cornwall and Isles of Scilly	0.6%	Manchester (DAT)	1.6%	Surrey	0.9%
County Durham	0.7%	Medway towns	0.4%	Sutton	0.3%
Coventry	0.7%	Merton	0.3%	Swindon	0.4%
Croydon	0.7%	Middlesbrough	0.6%	Tameside	0.5%
Cumbria	0.8%	Milton Keynes	0.3%	Telford and Wrekin	0.3%
Darlington	0.2%	Newcastle upon Tyne	0.8%	Thurrock	0.2%
Derby	0.8%	Newham	1.0%	Torbay	0.3%
Derbyshire	1.3%	Norfolk	1.3%	Tower Hamlets	1.2%
Devon	0.7%	North East Lincolnshire	0.5%	Trafford	0.3%
Doncaster (DAT)	0.8%	North Lincolnshire	0.4%	Wakefield (DAT)	0.9%
Dorset	0.5%	North Somerset	0.3%	Walsall	0.7%
Dudley	0.7%	North Tyneside	0.3%	Waltham Forest	0.5%
Ealing	0.9%	North Yorkshire	0.7%	Wandsworth (DAT)	0.6%
East Riding of Yorkshire	0.4%	Northamptonshire	1.1%	Warrington	0.3%
East Sussex	0.7%	Northumberland	0.5%	Warwickshire	0.6%
Enfield	0.5%	Nottingham (DAT)	0.9%	West Berkshire	0.2%
Essex	1.5%	Nottinghamshire	1.5%	West Sussex	0.7%
Gateshead	0.6%	Oldham	0.4%	Westminster	0.9%
Gloucestershire	0.9%	Oxfordshire	1.1%	Wigan	0.6%
Greenwich	0.6%	Peterborough	0.4%	Wiltshire	0.4%
Hackney	0.9%	Plymouth	0.7%	Windsor and Maidenhead	0.2%
Halton	0.2%	Poole	0.2%	Wirral	1.0%
Hammersmith and Fulham	0.5%	Portsmouth	0.5%	Wokingham	0.1%
Hampshire	1.4%	Reading (DAT)	0.4%	Wolverhampton	0.8%
Haringey	0.6%	Redbridge	0.5%	Worcestershire	0.9%
		Redcar and Cleveland	0.4%	York	0.4%

We then combined the above with the DIP data to assess the geographical coverage in each year. For each year the coverage percentages (above) were summed for all LAAs that provided data for that year. The results in the table below show that whilst the first year of DIP only covered around a quarter of the OCU population, from 2006 until its final year, LAAs covering between 94 and 98 per cent of the OCU population were recording DIP tests.

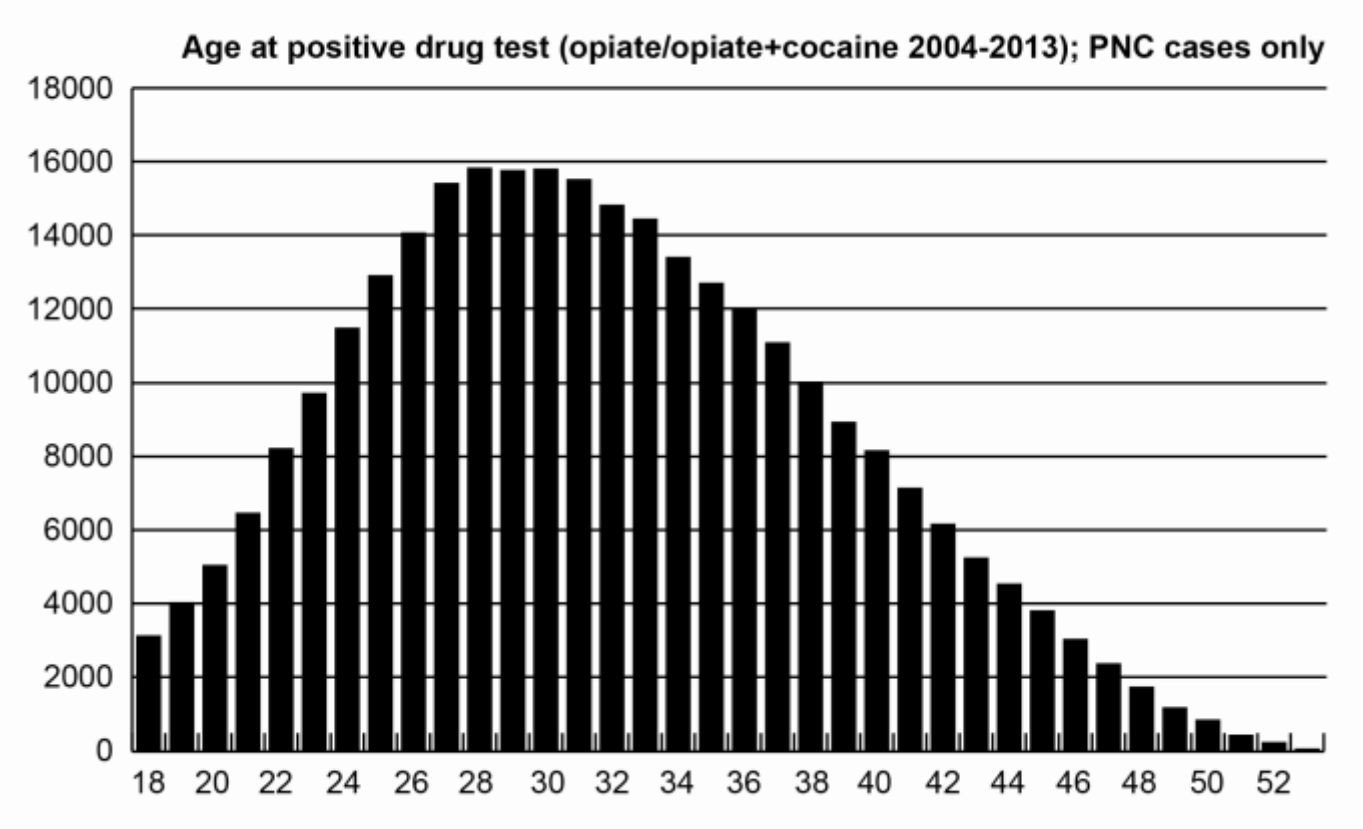
Estimated proportion of OCU population covered by DIP.

	2005	2006	2007	2008	2009	2010	2011	2012	2013[25]
Estimate of DIP's coverage	24.50%	94.4%	96.9%	97.4%	94.1%	97.5%	95.8%	98.4%	98.3%

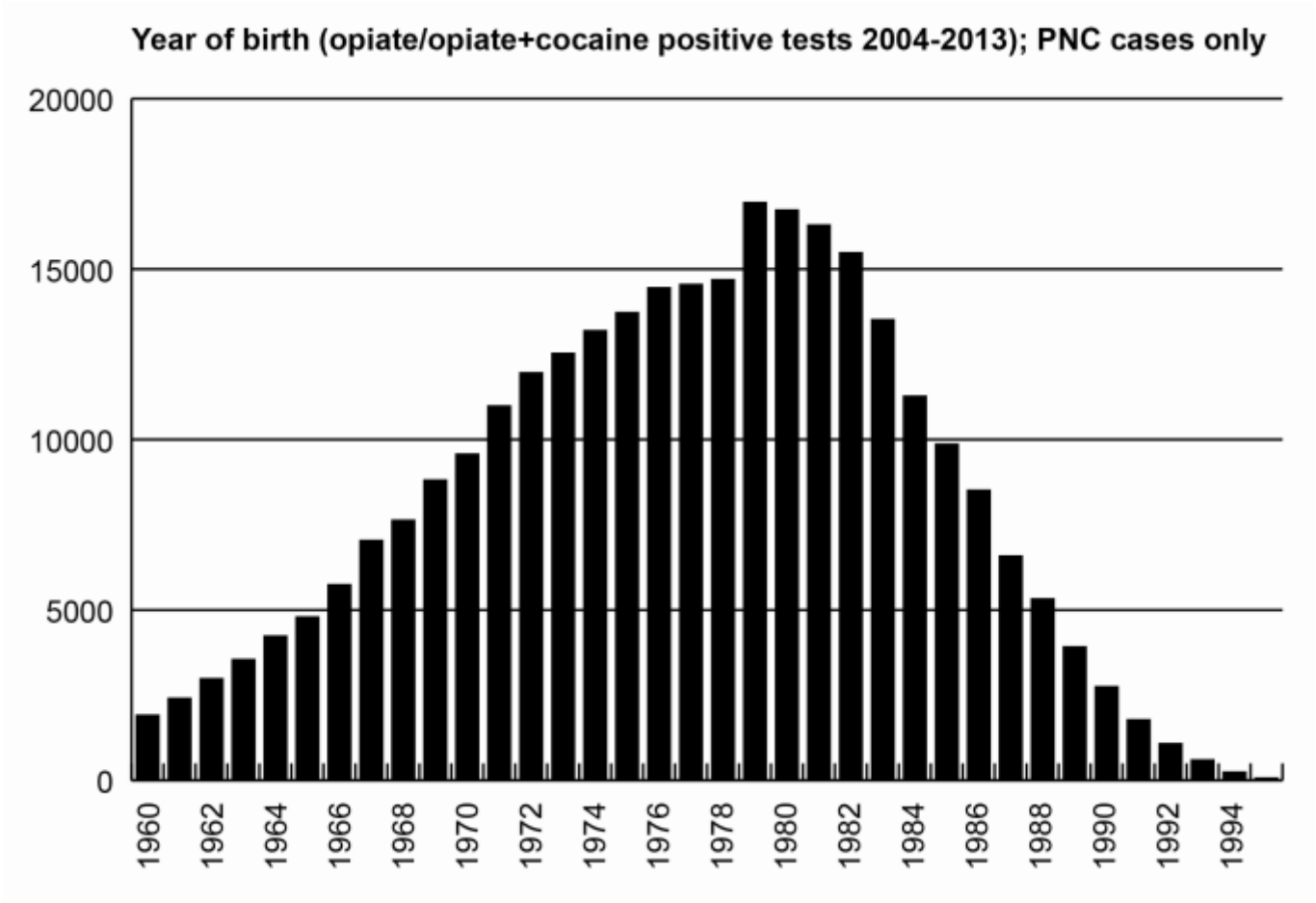
This lends a certain degree of confidence to the findings and suggests that the variation in geographical coverage from 2006 onwards will not bias the findings greatly. However, a few caveats need to be mentioned.

i) The above percentages only excluded LAAs that did not record any cases for the entire year. It is possible some LAAs only recorded cases for certain months within a particular year.
ii) Many of the findings from the report exclude cases in which no Police National Computer (PNC) number was recorded. Looking at the data it is clear that the proportion of cases without a PNC number varies across areas. So this will introduce some geographical bias.
iii) Using the published OCU figures by LAA to estimate DIP's geographical coverage involves the assumption that OCUs tend to get arrested in the same area in which they live and receive treatment.

Supplementary DIP charts, showing age and year-of-birth distributions for the 296,008 PNC cases with positive opiate/opiate + cocaine tests.



[25] Note that although the geographical coverage in 2013 is high, the data only cover the first 11 months of that year.



Modelling methodology

This brief section outlines the modelling process behind the conclusion in section one, which states that we might expect somewhere between 2,400 and 7,000 individuals from the original cohort of users in 2004 to be captured within the 2013 figure of *new* DIP arrestees (who test positive for opiates-only or who are positive-for-both).

We begin by putting in a plausible range of crime-involved OCUs through the period. This combines the total OCU estimates published by Hay *et al*., (ranging from around 320,000 OCUs down to around 295,000 in recent years) with available estimates of the percentage who are likely to be committing acquisitive crime. The latter was found to be almost exactly 50% in the NTORS study (Gossop *et al*., 2003). As such, a range of between 170,000 and 100,000 crime-involved OCUs is likely to include all plausible values (see first row of table below).

We then calculate the rate at which that population is likely to be arrested and test positive by using the number of individuals testing positive from 2008 (25,433), when DIP was fully up and running. This gives the second row of the table. Combining the values in the first two rows and applying the probability formula given in the main body of the text gives the third row: the probability of first positive DIP test in 2013. Note that this assumes all these individuals continue to offend through the period, which may not be the case, hence final results are probably an upper bound. The final row simply multiples the figure in the first row by the figure in the third to give our estimate of the original cohort who might appear in the 2013 DIP figures as new.

Number of (crime involved) OCUs	170,000	160,000	150,000	140,000	130,000	120,000	110,000	100,000
Implied arrest rate (based on DIP 2008 figures)	15%	16%	17%	18%	20%	21%	23%	25%
Probability of first arrest in 2013	4.1%	4.0%	3.8%	3.7%	3.4%	3.2%	2.8%	2.4%
Estimated capture of original cohort in 2013	6,955	6,366	5,752	5,113	4,455	3,782	3,102	2,429

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