Title: Testing for hepatitis C virus infection in UK Prisons: what actually happens?

Running title: Testing for HCV in UK prisons

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Acknowledgments: We gratefully acknowledge the assistance of Judi Gardener, Senior MLSO at University Hospitals of Leicester for providing the DBS data, Dr Boliang Guo, Lecturer in Statistics at University of Nottingham and CLAHRC-EM for statistical advice, Dr Paul Linsley at University Hospitals of East Anglia for PhD supervision and expert advice on prison research and Professor Steve Ryder, Hepatologist, Nottingham University Hospitals, for expert clinical and academic advice.

Funding: This research was funded by the National Institute for Health Research Collaboration for Leadership in Applied Health Research and Care East-Midlands (NIHR CLAHRC-EM). The views expressed in this article are those of the authors and not necessarily those of the NHS, the NIHR, or the Department of Health and Social Care.

Conflict of interest disclosures: WI has received speaker and consultancy fees from Roche, Janssen Cilag, Gilead Sciences and Novartis, educational grants from Boehringer Ingelheim, Merck Sharp and Dohme and Gilead Sciences, and research grant support from GlaxoSmithKline, Pfizer, Gilead Sciences, Janssen Cilag, Abbvie and Bristol-Myers Squibb.

ABSTRACT (250 words)

Prisons are a key demographic in the drive to eradicate hepatitis C virus (HCV) as a major public health threat. We have assessed the impact of the recently introduced national opt-out policy on the current status of HCV testing in 14 prisons in the East Midlands (UK). We analysed testing rates pre- and post-introduction of opt-out testing, together with face-to-face interviews with prison healthcare and management staff in each prison.

In the year pre-opt-out, 1,972 people in prison (PIP) were tested, compared to 3440 in the year following opt-out. From July 2016 – June 2017, 2706 people were tested, representing 13.5% of all prison entrants (median 16.6%, range 7.6% to 40.7%). Factors correlating with testing rates were: pre-admission location of the PIP (another prison or the community, OR 2.2, 95% CI 1.9-2.3, $p<0.001$); whether the PIP could access healthcare independently of prison officers (OR 1.7, 95% CI 1.5-1.8, $p<0.001$); an absence of out-reach services for HCV treatment (OR 1.3, 95% CI 1.2-1.5, $p<0.001$), whether >50% of PIP reported ease of access to a nurse (OR 2.0, 95% CI 1.8-2.2, $p<0.001$), and whether prison healthcare was supplied by private or NHS providers (OR 1.3, 95% CI 1.2-1.5, $p<0.001$).

Testing rates remained far below the minimum national opt-out target of 50%. Inadequacy of healthcare facilities and constraints imposed by adherence to prison regimens were cited by healthcare and management staff at all prisons. Without radical change, the prison estate may be intrinsically incapable of supporting NHSE to deliver the HCV elimination strategy.

Key words: Chronic viral hepatitis; prisons; diagnostic virology; hepatitis C

The campaign to eliminate hepatitis C virus (HCV) as a major public health threat by 2030 was established by the World Health Organisation in 2016[1] and given an accelerated target of 2025 in the UK this year.[2] The success of this campaign will depend on a comprehensive and efficient testing process for the diagnosis of HCV in high risk groups and engagement of infected individuals with viral eradication therapy. The prison population has a higher prevalence of HCV infection than the general community due to the proportion of people in prison (PIP) sentenced for crimes related to the use or distribution of drugs. In support of this, a Health and Justice Report[3] found that during 2014 seropositivity in prisons in the England and Wales estate was 1.5% for hepatitis B virus (HBV), 8% for HCV and 0.6% for human immunodeficiency virus (HIV) and a recent review estimated that 15.4% of PIP in Europe are infected in contrast to a prevalence of 0.5% in the general population.[4] Further, in addition to the on-going high seroprevalence of HCV, injecting networks in prisons are commonplace and provide an important driver of viral propagation.[5,6] For example, whilst a Scottish study identified a low incidence of HCV infection amongst all individuals in prison who admitted ever injecting drugs, it estimated a much higher incidence (25.8 – 33.8%) amongst those injecting during their current sentence.[7] High rates of testing PIP for HCV infection will therefore be a crucial determinant of the outcome of any elimination strategy.

Despite this background need, only 7.8% of (16,309/208,552) individuals entering prisons in 2013 were tested for blood borne viruses (BBV).[8] This very low rate led to a joint commissioning agreement between the National Offender Management Service, NHS England and Public Health England that proposed an opt-out testing approach for BBVs, based on the hypothesis that this would increase rates of test upake.[9] An opt-out approach requires testing to be embedded in routine care with the option to 'opt-out', in contrast to an opt-in approach where patients are asked if they would like to have a test.[10]The joint commissioning agreement stated that from April 2014 all PIP were to be tested near reception into prison or at other time points, unless they specifically declined,[9] with a target to test 50-75% of those admitted.[11] In view of the major importance of achieving these targets for the ultimate success of the national HCV elimination strategy, and in responding to impending increases in NHSE national targets for HCV treatment, we set out to evaluate the impact of opt-out testing on the rates of test uptake in 14 prisons in the East Midlands geographical region, as defined by the NHS commissioning board[12] and to identify factors contributing to the success or failure of this policy.

Methods

This report describes the first quantitative stage of a mixed methods sequential explanatory study conducted within a realist evaluation methodology. The qualitative interviews and the overall realist evaluation will be published separately. Data on the total numbers of HCV tests performed on PIP at each of the East Midlands prisons was obtained. Numbers of dried blood spot (DBS) tests received and tested were provided by the single regional

microbiology department undertaking all the assays. This data has been received monthly by the research team since August 2014 with the number of anti-HCV positive test results being reported from October 2015. Data on the number of venous samples tested for anti-HCV in the 12 month period before and after each establishment introduced the opt-out policy was requested from the eight different laboratories that provide this service to the prisons.

The numbers of PIP entering each prison per month, and the location from which they were admitted (e.g. from the courts or transferred from another establishment) were received via a Freedom of Information request to the Ministry of Justice. These data allowed determination of the denominator population of people entering prison who should have been tested for BBVs between January 2015 and July 2017. The PIP survey responses regarding access to healthcare reported by Her Majesty's Inspectorate of Prisons (HMIP)[13] published by the end of 2017 were also reviewed.

Field visits to all East Midlands prisons were undertaken between January and March 2016 to meet key stakeholders in order to clarify, at each institution: the process whereby new arrivals were dealt with by the healthcare team; which personnel were responsible for organising blood-borne virus testing (BBV), and the method(s) of sampling; the timing and location of BBV testing; the standard operating procedure (if present) for offering BBV testing; how PIP were able to access the prison healthcare facility; the date of commencement of DBS testing; and any perceived difficulties in achieving testing of PIP for BBV. Interviews were conducted with the head of healthcare (n = 4, one of whom managed 2 prisons), the deputy head of healthcare (n = 2), the primary healthcare matron (n = 2, one of whom was matron for 3 prisons), a senior healthcare nurse (n = 2) and a blood-borne virus lead nurse (n = 1). This contextualised the delivery of healthcare in which the opt-out approach to testing was situated.

Ethical approval was not believed to be required or sought for any of the above activities.

Data Analysis

Binomial logistic regression using SPSS V24 was undertaken to describe the relationships between the percentages of people tested (dichotomous dependent variable) and the following explanatory categorical variables: the PIP's previous location prior to admission, the location of testing within the prison, the requirement for a prison officer escort to attend an appointment in healthcare, the availability of an out-reach HCV treatment service, the ease of seeing a prison nurse within each prison, and whether the prison healthcare service was from private or NHS providers.

Results

Policy implementation

In the East Midlands, the opt-out policy was implemented at staggered times in the 14 prisons between August 2014 and July 2016. In addition, Public Health England (PHE) contemporaneously commissioned the use of DBS samples within prisons as the first line test to facilitate implementation of opt-out testing in the East Midlands. DBS tests are an advantageous tool for BBV testing in people who inject drugs (PWID) who frequently have damaged veins due to long term injecting,[14] so this method was anticipated to encourage PIP to engage in the testing process. The date of opt-out policy commencement in each prison was therefore taken as dating from the first DBS sample referred for testing from that prison (see Table 1).

Pre and post opt-out testing rates

The numbers of PIP undergoing testing for HCV in 14 prisons in the 12 months before and after the introduction of the opt-out policy in each prison is shown in Table 2 and Figure 1. Prison number 5, a category D open establishment, had not sent any DBS test requests so a surrogate opt-out introduction date was chosen in keeping with the PHE 2nd pathfinder phase in which this prison was included.[15] Overall, in the 12 month pre-opt-out policy period, 1,972 PIP were tested using venous samples. In the 12 month period after introduction of the opt-out policy, 3,440 venous and DBS samples were tested, out of a combined operational capacity in the 14 prisons of 9,539. Testing rates increased in ten establishments, and decreased in four. The range of the change in numbers tested was -52 to 533.

Analysis of factors associated with testing rates

(i) Operational features of prison healthcare

Prison healthcare in the UK is provided by either the NHS or a private organisation depending on local commissioning arrangements, with the aim of medical and nursing care providing the equivalent of primary healthcare. When entering a prison, it is stipulated by a mandatory Prison Service Order[16] that PIP should have an initial *first reception* health check which serves to triage immediate health needs, followed by a *second reception* health check within the first week that comprises a more comprehensive assessment of health and disability. These reception assessments are conducted by either general or mental health registered nurses and documented in an electronic template in SystmOne, the national clinical IT system. This template requires boxes labelled “Hepatitis B, C and HIV screening *offered*” to be ticked by the clinician. The PIP’s response dictates whether BBV testing takes place. Analysis of results from the 14 prisons found considerable heterogeneity on the timing and location of tests undertaken for blood borne viruses (BBV). Some establishments undertake the BBV test at either of the first or second appointments, whilst others arrange

to see the PIP who have agreed to be tested during a separate BBV clinic (Table 1) depending on the time and space available. For example, in prison number 2 the monthly intake of PIP is approximately 500, which prohibits the routine second reception check being offered to all new arrivals due to insufficient nurses and clinic space, so a more comprehensive combined assessment is undertaken at the initial reception. Prison number 1, with an intake solely from other prisons, also routinely combines the two health-checks when the PIP arrive, but cannot undertake testing at that time due to insufficient room space and nursing availability, so additional blood test clinic appointments are arranged.

Staff from all establishments reported that maintaining the prison's daily regime, or timetable, took precedence over any routine healthcare activity and that clinics could not overrun because the prison officers simply collect the PIP to return them to the location dictated by the prison regime. Furthermore, any incidents of violence or disruption, particularly episodes of concerted indiscipline, require additional prison officers to attend the location. This results in other PIP being required to stay where they are because there are no security staff to oversee their movement from one department to another, e.g. to attend an appointment at the healthcare department.

In half of the prisons the PIP were permitted to walk to the healthcare department unaccompanied by a prison officer at designated times of the day if they had an appointment. The majority of testing took place in the healthcare department but three prisons had clinic rooms in the prisoner accommodation (wings) and sometimes undertook testing there too. BBV testing was undertaken by both registered nurses and healthcare assistants and in one establishment by the substance misuse practitioners. Treatment for HCV via an out-reach model was available in eight prisons during the time frame evaluated, so those staff would have regular contact from hospital hepatitis specialist nurses.

Staff from all of the prisons described inadequate resources for the high volume testing that an opt-out policy would necessitate, for example insufficient nurse or prison officer time, inadequate clinic and waiting room space and limited time within the prison regime to see all prisoners and discuss BBV testing. Notably, there is a Prison Service Instruction[17] which mandates that people entering prisons are processed in the shortest possible time because the reception procedure can cause stress. For example, in prison number 1 there is an internal prison "bus to bed" target of less than 2 hours and prison number 2 aims to have PIP in their cells within an hour of their arrival.

Discussions with senior nurses and heads of healthcare at all locations confirmed that there is no nationally or locally established standardised wording to present the opt-out approach to testing to the PIP. Accordingly, whilst the notion of opt-out in general was understood, there was a lack of clarity and consistency in accurately presenting the opt-out policy for BBV tests to PIP. For example, at one establishment a senior nurse would go onto the prison wings at weekends and ask "anyone not yet had a finger-prick test for hep and HIV?" and

carry out DBS forthwith, in contrast to another prison where the PIP were simply asked on arrival “do you want hep jabs and testing?”.

(ii) Other factors

By 1st July 2016 all prisons except one (prison 5) had commenced using DBS tests, as commissioned locally for implementation of the opt-out policy, so this date was selected as the starting point to further analyse opt-out implementation during a consistent time frame for all sites. Data retrieved from the Ministry of Justice showed that overall, between 1st July 2016 and 30th June 2017, 56.3% (11,312/20,075) of people who entered an East Midlands prison came from another prison, and 42.8% (8,589/20,075) were admitted from a community location, either directly from the courts (6,907, 35%) or by recall due to breaching the terms of their licence release (1,682, 8%, see Table 3). During this period 2,706 people were tested, representing 13.5% of all who entered an East Midlands prison, with a range across all prisons of 7.6% - 40.7%, and a median of 16.6% (see Table 4). 1,643 of those were tested using DBS and 1,063 via standard venepuncture. The overall rate of anti-HCV positive results could not be calculated as this information from venous blood samples was not available from all participating laboratories, but of the DBS tests, the anti-HCV positivity rate was 9.3% (152/1,643), with a between-prison range of 0% to 23% and a median of 3.5%.

Five factors were shown to correlate with prison testing rates (Table 5): testing rates were higher if the main prison intake was from other prisons rather than the community (OR 2.2, 95% CI 1.9-to 2.3, p<0.001); where the PIP could walk to their healthcare appointment independent of a prison officer (OR 1.7, 95% CI 1.5-to 1.8, p<0.001); where hepatitis C treatment was provided at the hospital rather than via an out-reach service (OR 1.3, 95% CI 1.2-1.5, p<0.001), where over 50% of PIP reported it was easy to see a nurse (OR 2.0, 95% CI 1.8-2.2, p<0.001), and where prison healthcare was private, rather than NHS providers (OR 1.3, 95% CI 1.2-1.5, p<0.001). The location of testing within the prison i.e. a room near the accommodation wing or in the healthcare department was not shown to correlate with testing rates (OR 1.1, 95% CI 0.99 – 1.2, p<.063). Of the DBS samples collected the anti-HCV positivity rate was 4-fold greater in prisons where the largest intake was from the community, rather than from another prison (OR 3.9, 95% CI 2.7 – 5.6, p < .001).

Discussion

The introduction of opt-out testing across the East Midlands prison estate resulted in an increase in the number of anti-HCV tests performed from 1972 to 3440 in the 12 months pre- and post- operationalisation of the policy in each prison (Table 2, Figure 1). Using a time-frame when opt-out testing had been introduced across all 14 prisons, and where Ministry of Justice data on the number of people entering/leaving each prison was available

(July 2016 to June 2017), 2706 tests were performed, out of a population of 20075 admissions across the estate (Table 4), giving a crude rate of 13.5%. This outcome is very far below the Health and Justice Indicators of Performance lower testing threshold of 50% and entirely inconsistent with achieving WHO targets.[11]

There are a number of unavoidable constraints on our data. Most importantly, there are systematic difficulties in defining both the denominator (the total population that ought to have been tested) and the numerator (number of PIP tested) used for calculating testing rates. Whilst this is the first study, to the authors' knowledge, to incorporate novel Ministry of Justice data detailing the numbers of people entering prisons over time, some individuals may have entered more than one prison in the study period, leading to an over-estimate of the denominator. For the numerator, it cannot be assumed that the tests recorded were, in fact, limited to those who entered the prison estate, as PIP already within the estate who did not move prisons within the study timeframe may also have contributed to the test numbers. It is also likely that some of the DBS samples were duplicates from the same individual, especially for those PIP moving between prisons, and similarly, that some venous samples were sent from PIP already tested by DBS, in order to confirm positive DBS test results. We are unable to quantify this without reference to individualised patient data, but given that the HCV positivity rates from venous samples in 5 prisons were in excess of 20% (see Table 4), we believe the combined total of DBS plus venous samples will, in fact, be greater than the true number of PIP tested. Our figure of 13.5% PIP tested (2,706 by either DBS or VBT of an intake of 20,075 entrants) is therefore the best calculation we can perform on the available data, but we believe this likely to be an overestimate. There is an evident need for more accurate data relating to the numbers of individuals tested (as opposed to the numbers of tests performed) and the true denominator against which to compare the numbers tested.

A greater understanding of the factors which impact on testing may inform changes within individual prison services. Category B remand prisons, with the highest rates of admission from the community, had the lowest rates of testing. These prisons tend to have a shorter length of stay (10 weeks for HMP Nottingham) and much higher turnover of PIPs than prisons accommodating sentenced PIP (Table 3). Low rates of testing in this environment risk failure to identify HCV infection in high risk groups who are then returned to the community and deprived of the chance to receive anti-viral therapy in a relatively stable prison environment. Remand prisons are therefore a focus for quality improvement initiatives. The importance of ease of access to healthcare, identified in this context as the ability to attend appointments unescorted and the perception of easy access to nurse support, is consonant with the importance of minimising structural barriers to accessing care in other settings.[18,19] While prison regimens will have to take precedence, improving access to healthcare may nonetheless be an achievable target.

The observations that out-reach services impacted negatively on testing rates (which is somewhat counter intuitive), and that undertaking HCV testing on the prison wings may increase uptake (this did not quite achieve statistical significance, p = 0.063) will be explored in a future qualitative publication following interviews with PIP. The former is likely to reflect the established importance of confidentiality within the prison system.[6,20] Attendance at a clinic known to be specifically set up for individuals at risk of HCV infection may lead to social rejection by observant PIP making assumptions about risk behaviours or HCV status, thereby contributing to stigma and creating a barrier to PIP accessing care pathways. Preference for testing on wings most likely reflects a reluctance of individual PIP to leave their wing for a number of reasons, including competing time-restricted activities (e.g. preference for receipt of items purchased in the canteen rather than spending time going to healthcare) and fear of violence if a PIP has drug debts or is a sex offender in a non-specialist prison. A consequence of this finding would be to recommend that testing should be available at different locations and time points in the prisons.

We also identified serious misinterpretations of what an opt out policy actually means, so it is possible that improved training and more appropriate introduction of a true opt-out policy may result in some increase in testing numbers. We suggest that the consistent use of a simple phrase such as *"We test everyone who comes into prison for hepatitis C (which is completely curable), hepatitis B and HIV (which are treatable), is that OK with you?"* may help increase uptake. We note, however, that all management and healthcare staff interviewed from each of the 14 prisons described inadequate resources for the high volume testing required by an opt-out policy, for example insufficient nurse or prison officer time, inadequate clinic and waiting room space and limited time within the prison regime to see all prisoners and discuss BBV testing. Current prison infrastructure is therefore likely to be the principle rate determining factor.

We have been unable to locate any directly comparable studies in the literature. However, HCV testing rates increased in a North-East prison from 2.3% in 2014/15 to 35% in 2016/17 following the introduction of the opt-out approach and concurrent DBS test method. [21] The key features to note were a combined hospital, prison and commissioning Task and Finish group who introduced a robust test and treat pathway, and nurses adopting a positive approach to positioning BBV testing as a routine component of entering prison. There are further examples of the opt-out approach being effective in different clinical contexts. NHS England cited increased uptake of testing for blood borne viruses in some genitourinary clinics and emergency departments as evidence for adopting this approach in prisons.[8] However these community contexts contrast sharply with a prison environment where multiple environmental, psycho-social and cultural differences impact on all stages of the process. A wider corpus of evidence is available from the US prison system. Significant increases in testing for HIV in that system following introduction of an opt-out policy have been reported, with a final figure in all cases exceeding 75%. [22–24] All of those prisons, however, also tested routinely for syphilis, so PIP were opting out of a blood test on a

sample collected for a different clinical purpose. Three further studies report that opt-out testing for HIV increased from 7% to 73% in a female prison[25] from 20% to 53% in a male prison [26]and from 70% to 98% in a mixed prison [27]when tested the day after arrival using rapid point of care oral tests. These studies suggest that moving towards a test which does not require a blood sample and/or provides a same day result may impact on uptake of testing offered as part of an opt-out policy.

In summary, we have conducted an evaluation of HCV testing in a large UK Prison Estate. Whilst this evaluation was conducted in a single geographical region, the 14 prisons in the East Midlands vary in security category, size and purpose, and are therefore likely to provide a representative sample of the challenges of conducting efficient testing for HCV in UK prisons. Further, the different data types gathered in our study collectively strengthen the evaluation by highlighting factors which were predictive of uptake and supplying a broader insight into the issues at stake beyond simply the test uptake figures. Prisons present an apparently opportune context for the delivery of healthcare, and a more ordered environment for the delivery of treatment than many community settings. They are, however, principally establishments that remove individuals' liberty both as punishment and for public protection, so the maintenance of prison security regimens will always be the priority. The evidence presented here clearly illustrates that rates of anti-HCV testing in a representative prison estate in the East Midlands following the introduction of opt-out testing remain far below national targets. Our study indicates that, despite models of successful interventions in individual prisons (see Table 2 and reference 21), urgent systematic change is required to create simple and transferable models of care and normalize the concept of HCV testing in prisons. Further, our multiple data sources and contextual information from stakeholders lead us to conclude that, while an increased application of the opt-out policy may make an incremental change, the major factors operating in this failure relate principally to the infrastructure within prison healthcare facilities, which in most prisons are not equipped in terms of staff or space to deal with the increased workload that a 50% testing target would engender, and the low priority of BBV testing within the overall prison regimen. As the prison estate is a critical demographic in the UK drive to eliminate HCV as a major public health threat by 2025[2] our findings have major implications for the success of this policy. We therefore suggest that further dialogue between the National Offender Management Service, NHS England and Public Health England will be required to take account of our findings and ensure the ultimate success of strategies to increase rates of testing for HCV in UK prisons.

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Table 1. Operational features of the 14 East Midlands prisons

Prison	Prison security category[1]	Opera-tional capacity[2]	Timing of BBV testing	Source of largest intake of prisoners	Health-care provider	Escorted by Prison Officer or unescorted to health care department[3]	Testing on wings	In-reach HCV treatment available	% reporting easy or very easy to see prison Nurse[2]
1	C	1088	BBV test clinic	Other prison		Both	yes	yes	35
2	B local	1048	2nd Reception	Community		PO escort	no	yes	25
3	C	841	BBV test clinic	Other prison		PO escort	no	no	64
4	B training	915	2nd Reception and Well Man clinic	Other prison		PO escort	no	yes	41
5	D	581	Rarely test	Other prison		Unescorted	no	no	53
6	Female closed	343	BBV test clinic, on wings	Community		Unescorted	yes	yes	33
7	B local	729	Combined 1st and 2nd reception	Community		PO escort	no	no	31
8	D	420	2nd Reception	Other prison		Unescorted	no	no	81
9	C	681	2nd Reception	Other prison		PO escort	no	yes	48
10	B local	325	BBV test clinic	Community		PO escort	no	yes	48
11	Young offender	515	1st or 2nd Reception	Other prison		Unescorted	no	yes	53
12	B training	697	2nd Reception and BBV clinic	Other prison		Unescorted	no	yes	67
13	C	734	2nd Reception and BBV clinic	Other prison		Unescorted	yes	no	42
14	B	622	2nd Reception	Other prison		unescorted	no	no	39

(1) Prisons are assigned a security category according to the degree of protection they provide to reduce the risk of escape posed by the PIP housed in each establishment The PIP are assigned a category according to the lowest level of security required to safely retain them in custody whilst simultaneously protecting the public by preventing the PIP from escaping. Male and female prisons have different categories: Category B -Men for whom the very highest conditions of security are not necessary but for whom escape must be made very difficult; Category C - Men who cannot be trusted in open conditions but who do not have the resources, will or determination to attempt escape; Category D - Men who can reasonably be trusted in Open conditions; Young Offender Institution - Young men aged 18 to 21 years, either Open or Closed conditions; Female Closed - Women who do not necessarily pose such a risk to the public that would warrant a place in a high security establishment but who are too high risk for an open prison.

(2) Operational capacity and PIP perception of ease of seeing a nurse are taken from Her Majesty's Inspectorate of Prisons reports.

(3) Some prisons permit PIP to walk to the healthcare department unaccompanied, others require prison officers to collect PIP from the wings and take them. This can be dependent on the prisons security category or the PIPs behaviour.

Table 2. Details of anti-HCV testing per prison during 12 months pre and post introduction of the opt-out policy.

Prison	Number of VB samples sent 12 months before DBS began	VB samples anti-HCV positive: n (%)	Date first DBS	Number of DBS samples sent in first 12 months	DBS anti-HCV positive: n (%)	Number of VB samples sent in first 12 months of DBS use	VB samples anti-HCV positive: n (%)	Number of VB and DBS tests combined in first 12 months of opt-out policy	Difference in number of tests (VB vs DBS and VB combined) in first 12 months after introduction of opt-out policy
1	250	36 (14.4)	Mar-16	248	36 (14.5)	85	32 (37.6)	333	83
2	540	84 (15.5)	Aug-14	281	not recorded	375	51 (13.6)	656	116
3	92	4 (4.3)	May-15	5	not recorded	84	3 (3.6)	89	-3
4	226	28 (12.4)	Jul-15	2	not recorded	172	27 (15.7)	174	-52
5*	115	not recorded	Jan-15	0	not recorded	131	not recorded	131	16
6	273	not recorded	Feb-15	115	not recorded	132	not recorded	247	-26
7	273	49 (17.9)	Feb-15	322	not recorded	69	6 (8.7)	391	118
8	38	6 (15.8)	Feb-15	281	not recorded	12	3 (25)	293	255
9	0	0	Aug-14	125	not recorded	1	1	126	126
10	22	14 (66.6)	Jan-16	43	1 (2.3)	88	27 (30.7)	131	109
11	10	1 (10)	Feb-15	526	not recorded	17	2 (11.8)	543	533
12	41	9 (22)	Jul-16	2	0	37	6 (16.2)	39	-2
13	40	not recorded	Mar-16	163	7 (4.3)	19	not recorded	182	142
14	52	not recorded	Apr-16	102	0	3	not recorded	105	53
TOTAL	**1972**			**2215**		**1225**		**3440**	

* Young Offender Institution. Decommissioned April 2017.

VB = Venous Blood; DBS = Dried blood spot

Table 3. Number of people entering each of the 14 East Midlands prisons from each location between 1st July 2016 and 30th June 2017[1]

Prison number	Prison security category	Location Type					Operational capacity
		From other prison	From court	From licence recall	From other location[(2)]	Total entering prison	
1	C	1,847	1	0	0	1,848	1088
2	B local	1,634	3,422	880	76	6,012	1048
3	C	436	2	0	2	440	841
4	B training	625	0	0	1	626	915
5	D open prison	980	0	0	1	981	581
6	Female closed	204	954	144	11	1,313	343
7	B local	755	1,505	387	46	2,693	729
8	D open prison	558	0	0	0	558	420
9	C	1,073	0	0	1	1,074	681
10	B local	724	774	224	28	1,750	325
11	YOI*	847	247	47	5	1,146	515
12	B training	221	0	0	3	224	697
13	C	1,108	0	0	0	1,108	734
14	B	300	2	0	0	302	622
All prisons		**11,312**	**6,907**	**1,682**	**174**	**20,075**	**9,359**

(1) A prisoner may be admitted to prison custody on more than one occasion during a quarter, and a prisoner may be admitted on multiple occasions across different quarters. For example, a prisoner will be counted as being admitted to prison custody the first time they enter prison custody for an offence committed, further if the prisoner is transferred to another prison within the East Midlands, this will also be counted as an 'admission'.

(2) Other locations include high security hospitals and approved premises.

Table 4. Anti-HCV Venous and DBS samples requested between 1st July 2016 and 30th June 2017

Prison	n = tested with dried blood spot samples	n= anti-HCV DBS positive results	% = anti-HCV DBS positive results	n = tested with venous blood samples	n= anti-HCV VBS positive results	% = anti-HCV VBS positive results	n = total tests	n = admissions to prison July 2016 to June 2017	% prison intake total tested
1	185	24	13	86	45	52.3	271	1848	14.7
2	136	27	19.9	320	65	20.3	456	6012	7.6
3	1	0	0	110	1	0.9	111	440	25.2
4	0	0	0	181	18	9.9	181	626	29
5	0	0	0	109	n/a	n/a	109	981	11.1
6	144	28	19.4	69	27	39.1	213	1313	16.2
7	245	37	15.1	75	8	10.7	320	2693	11.9
8	222	7	3.2	5	4	80	227	558	40.7
9	189	4	2.1	0	0	0	189	1074	17.6
10	123	12	9.8	29	14	48.3	151	1750	8.6
*11	215	8	3.7	15	8	53.3	231	1146	20.2
12	2	0	0	42	7	16.7	38	224	17
13	105	5	4.8	22	n/a	n/a	127	1108	11.5
**14	76	0	0	n/a	n/a	n/a	76	302	0
TOTAL	**1643**	**152**	**9.3**	**1063**	**197**	**18.5**	**2706**	**20075**	**13.5**

*Establishment decommissioned April 2017

** Venous sample data was not supplied per month so unable to align with time frame. However from 01.04.16 to 31.03.17 they requested 3 tests and between 01.04.17 to 31.10.17 they requested 4 tests.

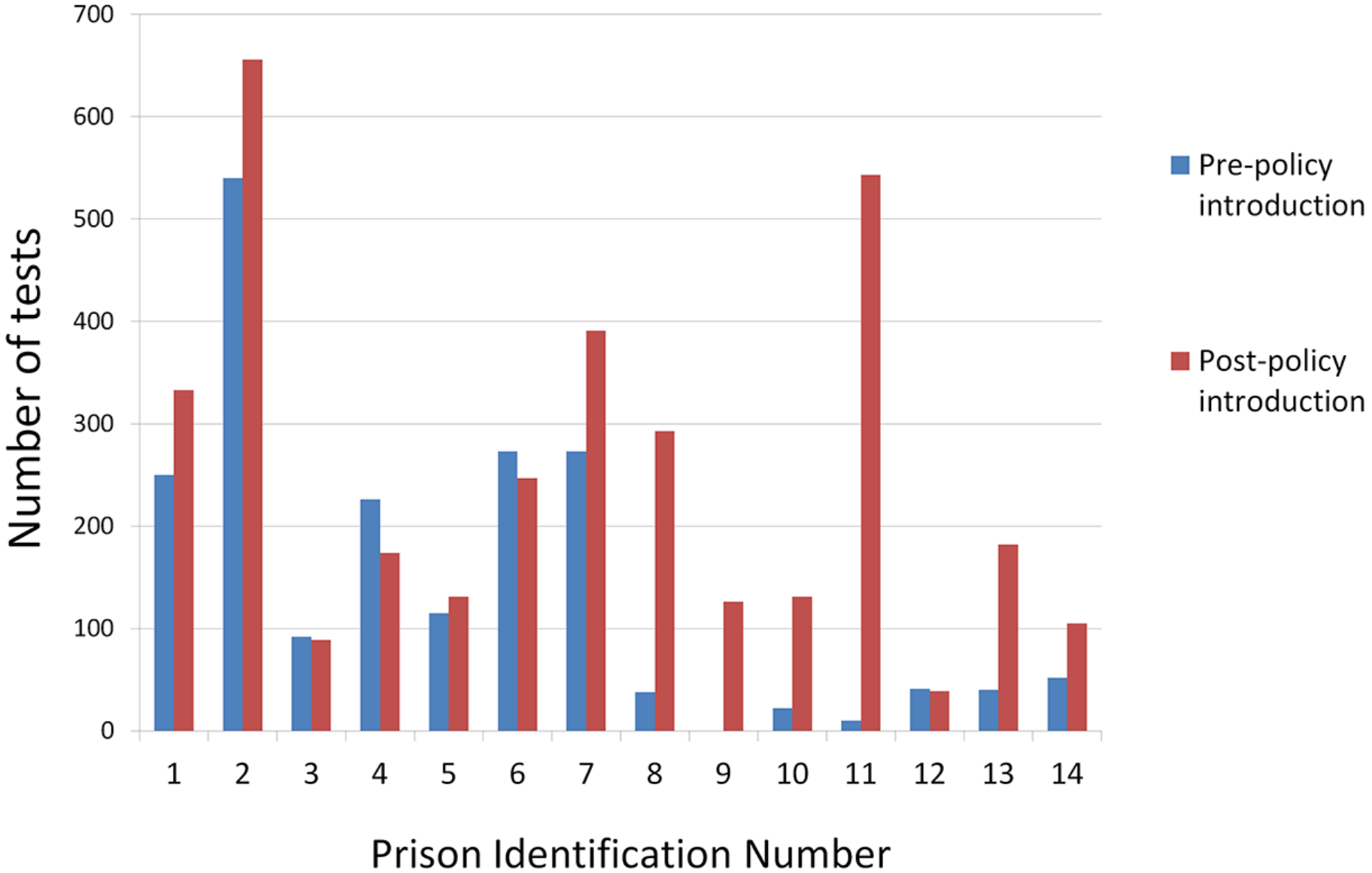
Table 5. Prison factors associated with venous and dried blood spot test uptake

Prison healthcare characteristic	**n=**	**%**	**OR (95% CI)**	**p=**
HCV tests undertaken where largest intake is from the community (n=4 prisons)	1,140/ 11,768	9.7		
HCV tests undertaken where largest intake is from another prison (n=10)	1,560/ 8,307	18.8	2.2 (1.9-2.3)	<.001
HCV tests undertaken when prison officer escort to healthcare required (n=6)	1,679/ 14,443	11.6		
HCV tests undertaken when prison officer escort to healthcare not required (n=7)	1,021/ 5,632	18.1	1.7 (1.5-1.8)	<.001
HCV tests undertaken on or close to prison wings (n=3)	611/ 4,269	14.3		
HCV tests undertaken in central prison healthcare department (n=11)	2,089/15,806	13.2	1.1 (0.99 – 1.2)	0.063
HCV tests undertaken when in-reach anti-viral treatment available (n=8)	1,730/ 13,993	12.4		
HCV tests undertaken when in-reach anti-viral treatment not available (n=6)	970/ 6,082	16	1.3 (1.2-1.5)	<.001
HCV tests undertaken where HMIP* reported < 50% said it is easy to see nurse (n=9)	1,984/ 16,726	11.9		
HCV tests undertaken where HMIP* reported > 50% said it is easy to see nurse (n=5)	716/ 3,349	21.4	2 (1.8 - 2.2)	<.001
HCV tests undertaken in prisons where healthcare provider is NHS (n=9)	2002/15965	12.5		
HCV tests undertaken in prisons where healthcare provider is private (n=4)	587/3670	16.0	1.3 (1.2-1.5)	<.001

* Her Majesty's Inspectorate of Prison

Figure legend:

Figure 1. Number of HCV tests requested in 14 prisons during 12 months before (venous blood samples) and after (DBS and venous samples combined) the introduction of the opt-out policy.


700
600
500
400
300
200
100
0
Number of tests
1
2
3
4
5
6
7
8
9
10
11
12
13
14
Prison Identification Number
Pre-policy introduction
Post-policy introduction