Hepatitis C among people who inject drugs: Local area estimates of prevalence to guide those who commission services in England.

Estimates using data from 2009 to 2011.

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Background

Information regarding the prevalence of hepatitis C virus among people who inject drugs (PWID) is important as a guide for agencies involved in the commissioning and development of services for people who use drugs. The Health Protection Agency (HPA) currently monitors the prevalence of hepatitis C antibodies among PWID across England through the national Unlinked Anonymous Monitoring (UAM) Survey of PWID attending specialist drug services [1]. This survey provides both national and regional data on the prevalence of hepatitis C among PWID. Local estimates of the prevalence of hepatitis C among PWID would be particularly useful to local partnerships when they undertake Joint Strategic Needs Assessments [2] and commission services for people who use drugs; however, these are not directly available from the UAM Survey.

The HPA, with assistance from the National Treatment Agency, has recently developed a means of estimating hepatitis C prevalence among PWID in each local partnership (Drug Action Team) area. This approach aims to produce estimates of hepatitis C prevalence suitable for use in the commissioning of local services. As the estimates are based on prevalence data obtained from the UAM Survey, they only reflect the prevalence among PWID in contact with specialist services, such as, needle and syringe programmes and drug treatment services. The prevalence among those who are not in contact with such services might be different.

The UAM Survey monitors blood borne viral infection levels among PWID in contact with a broadly representative sample of specialist drug services. Data available from this survey on the hepatitis C prevalence among those who had injected during the preceding year has been related to other local level data, such as the numbers in drug treatment, population age structure, and crime levels. The relationship between these data and the hepatitis C prevalence measured in the UAM Survey, has then been used to estimate the prevalence of hepatitis C in all local partnership areas, using what is called a 'spatial model'. Data for the three year period from 2009 to 2011 were used. The estimates presented here are for the prevalence of hepatitis C antibody; it should be noted that not all of those with antibodies will have current hepatitis C infection. Details of the method used here have been previously published [3]. Further information on the methodology is given in the Technical Appendix at the end of this document.

The method used in this process is undergoing further development; this will make greater use of data on drug treatment to produce estimates with narrower confidence intervals in the future. Whilst these estimates should be used cautiously, they can be viewed as being indicative of the likely prevalence of hepatitis C. They are presented with 80% credible intervals to give an indication of the plausible range of prevalence in each local area.

Estimated prevalence of antibodies to hepatitis C

The estimates indicate that the prevalence of antibodies to hepatitis C at the local level vary considerably across England, ranging from 17% to 82%. The prevalence estimate for each area, and its credible interval (which is similar to confidence interval), are given in the Table below.

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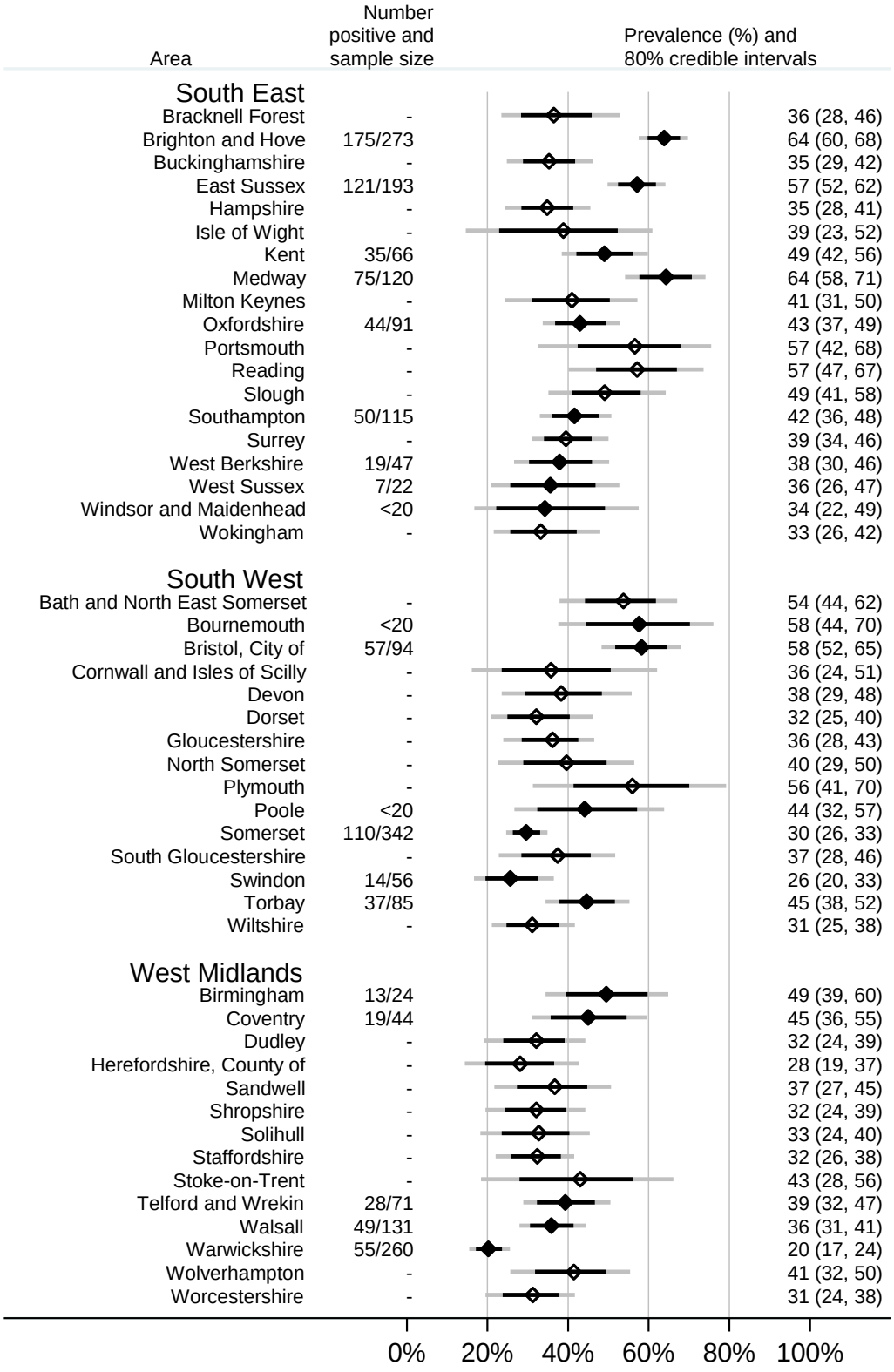
1 Unlinked Anonymous Monitoring Survey of People Who Inject Drugs. www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1202115519183

2 Joint Strategic Needs Assessments Support. National Treatment Agency. www.nta.nhs.uk/healthcare-JSNA.aspx

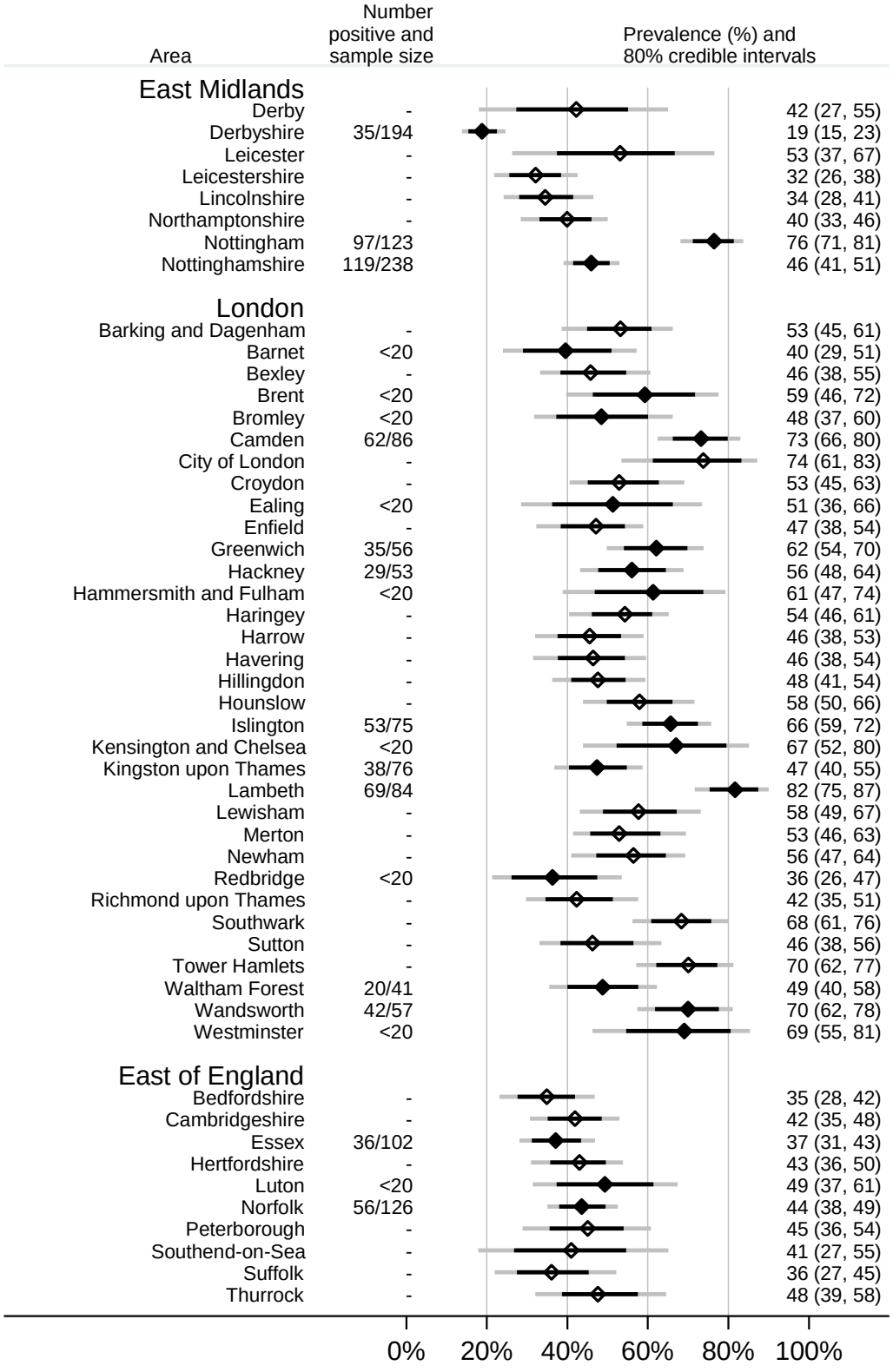
3 Spatial mapping of hepatitis C prevalence in recent injecting drug users in contact with services. Harris, RJ; Hope, VD; Morongiu, A; Hickman, M; Ncube, F; DE Angelis, D. *Epidemiol Infect*, 2012;140(6):1054-63.

Table: Estimates, and 80% credible intervals, for the prevalence of antibodies to hepatitis C among people who inject drugs in England, by local area.



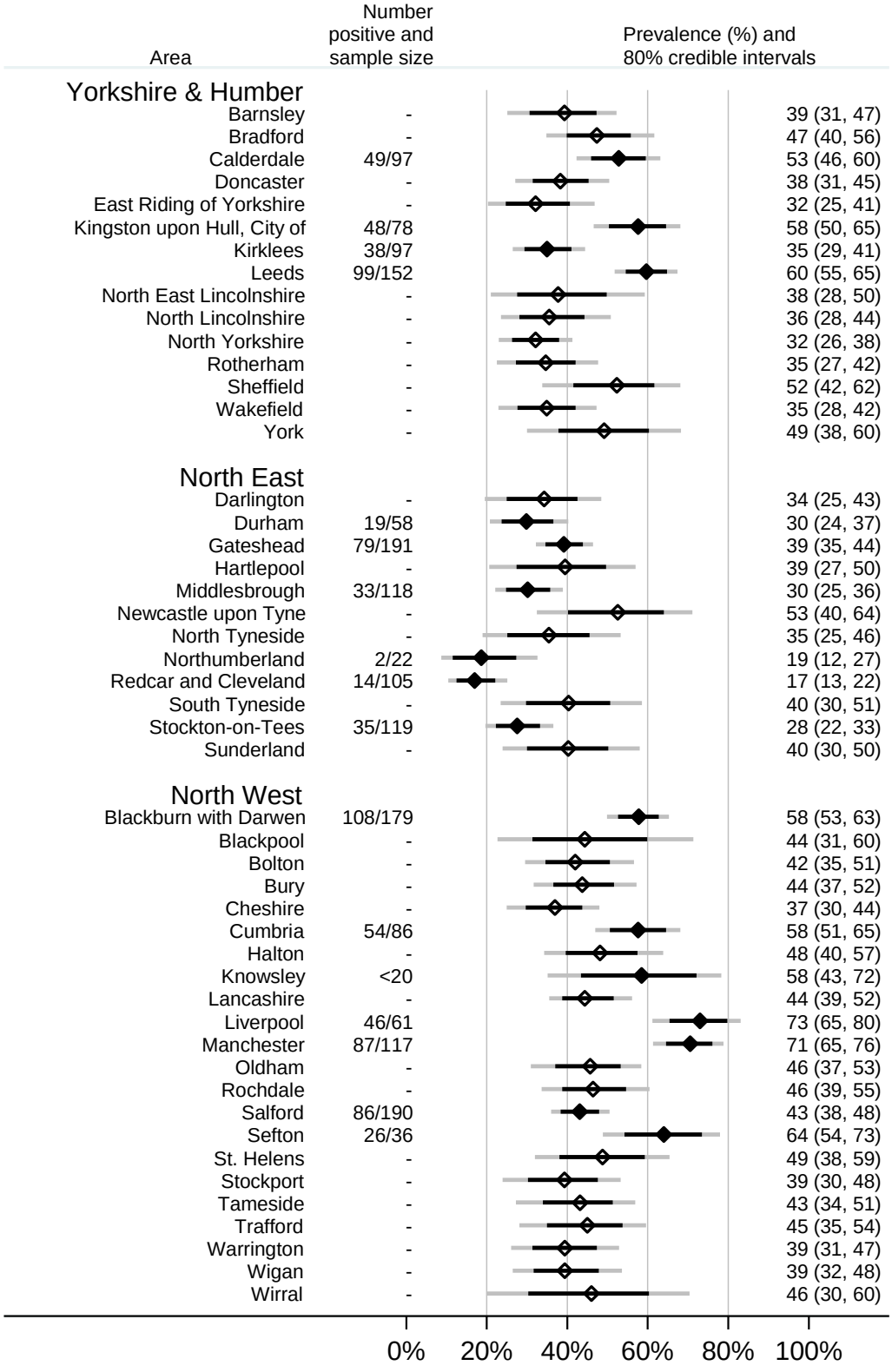
The solid diamonds represent the sampled areas and the hollow diamonds the non-sampled. The dark grey bars around the estimates indicate 80% credible intervals, the light grey bars 95% credible intervals.

Table Cont.



The solid diamonds represent the sampled areas and the hollow diamonds the non-sampled. The dark grey bars around the estimates indicate 80% credible intervals, the light grey bars 95% credible intervals.

Table Cont.



The solid diamonds represent the sampled areas and the hollow diamonds the non-sampled. The dark grey bars around the estimates indicate 80% credible intervals, the light grey bars 95% credible intervals.

The number of samples included in the analysis in some of the sampled areas is small. This is because the services participating in the UAM Survey in some areas mostly recruit former injectors who are excluded from the analysis here. In addition, a collaborating site may have only been involved in the survey for a single calendar year, as the participating sites change over time.

Understanding and using these estimates

This section is intended to help those who commission services for people who use drugs in the interpretation of these estimates. It also briefly explores some of the issues that should be considered when commissioning services. This is done by considering three broad bands of hepatitis C prevalence.

Higher prevalence areas, where hepatitis C antibody prevalence is higher than 60%. In these areas, the majority of those injecting drugs will be living with hepatitis C. Those starting to inject are likely to be exposed to hepatitis C very soon after initiating injecting, and thus should be a key target group for preventive interventions such as outreach, needle and syringe programmes, and safer injection advice. As there are likely to be many undiagnosed hepatitis C infections, voluntary confidential diagnostic testing for hepatitis C should be easily accessible to all PWID. Needle and syringe programmes, substitution therapies, and recovery focused drug treatment should be widely available and easy for all PWID to access. All these services should offer onsite access to voluntary confidential diagnostic testing for hepatitis C (and other blood-borne viruses).

Medium prevalence areas, where hepatitis C antibody prevalence is between 40% and 60%. In these areas, about half of PWID will be infected overall, and the majority of longer term injectors are likely to be infected with hepatitis C. However, most of those who have started injecting more recently are likely to be uninfected. Services that aim to prevent infection, such as needle and syringe programmes, substitution therapy, and safer injection advice, are particularly important and should be very widely available. These services should also actively support entry into recovery focused drug treatment. Voluntary confidential diagnostic testing for hepatitis C (and other blood-borne viruses) should also be easy for PWID to access through a wide range of settings.

Lower prevalence areas, where hepatitis C antibody prevalence is less than 40%. In these areas most PWID will be uninfected. However, it is likely that among longer term injectors (those injecting for more than 15 years) the majority will be infected. Therefore, services which aim to prevent infection, such as needle and syringe programmes, substitution therapy, and safer injection advice, are highly important and need to be very easy to access and very widely available. These services should also actively support entry into recovery focused drug treatment. Accessible voluntary confidential diagnostic testing for hepatitis C (and other blood-borne viruses) should be available to all PWID, but targeted testing aimed at longer term injectors should be considered too.

In all areas, care pathways for those diagnosed with hepatitis C infection should be in place.

Other useful sources of information

Further information about UAM Survey of PWID, and data from the survey, can be found here: www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1202115519183

Further information on about hepatitis C can be found in the *Hepatitis C in UK* report: www.hpa.org.uk/webw/HPAweb&HPAwebStandard/HPAweb_C/1317135237627

and on the HPA website: www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733744529

For further information about the UAM Survey and these estimates, please contact the IDU Team, HIV/ STI Department, HPS Colindale, Health Protection Agency, London.

Technical Appendix

A previous published analysis used a spatial model to estimate hepatitis C antibody prevalence in PWID in contact with specialist services in 2008, using data from 2006 to 2008. This was based on data from the UAM Survey of PWID on the prevalence of hepatitis C among current PWID participating in the survey. The model incorporated auxiliary variables – routine data or statistics available for all areas - that were found to be related to hepatitis C prevalence at the Drug Action Team (DAT) level and spatially correlated random effects. The latter assumes that prevalence in neighbouring areas will not be completely independent of each other. These two components allow the estimation of hepatitis C prevalence in local areas (DATs) that are not sampled in the UAM Survey. We undertook a spatial analysis similar to that used previously, using UAM Survey data for the period 2009 to 2011.

In this analysis, data on "recent injectors" – those who have stated that they have injected in the last year – from the UAM Survey are used. We examined a model that closely matched the previous analyses, using the proportion of adult population aged under 35 years (henceforth, population <35) and drug crime as auxiliary variables. The model also included effects for age (four groups: aged 15 to 24 years, 25 to 34 years, 35 to 44 years, and 45 years & over), sex and calendar year; and unstructured and spatially correlated DAT-level random effects. In the last three years, the UAM Survey has switched from oral fluid samples to dried blood spot samples; we therefore took into account the different sensitivity and specificity of the hepatitis C antibody tests on these samples in our analysis.

The age-sex specific estimates of HCV prevalence in each DAT are related to National Drug Treatment Monitoring System (NDTMS) data on those that have reported injecting in either their most recent Treatment Outcomes Profile (TOP), or any TOP in the last two years. Although there are no directly matching criteria between the two surveys, these definitions should be broadly comparable. As before, the NDTMS data were used to obtain age-sex distributions of the population of injectors in treatment; and therefore correctly weight the age-sex specific estimates of HCV prevalence and produce overall prevalence estimates by DAT in this population.

From the UAM Survey, 5,192 individuals that had complete data on age, sex, injecting duration and hepatitis C status were included: 939/2,021 (46.5%) of oral fluid samples and 1,554/3,171 (49.0%) of dried blood spot samples were hepatitis C antibody positive. In total, 59/149 DATs were sampled in at least one survey-year. Table A1 shows the distribution of age, gender, injecting/drug use duration and year in the UAM Survey and NDTMS data. Distributions for age and sex appear to be broadly similar, with slightly older ages in the UAM Survey data. There are a greater number of those in the 0 to 2 years injecting category (UAM Survey) vs. the 0 to 2 years drug use duration (NTDMS). This is expected as total drug use duration will be at least as long as injecting drug use. Numbers in the 15 or more years injecting/drug use duration groups are similar, which may be due to the slightly older age of those sampled in the UAM Survey.

In the spatial model, the auxiliary variables population <35 years and drug crime showed a positive association with hepatitis C prevalence as in the previous analysis: population <35 years Odds Ratio (OR) = 1.29 per Standard Deviation (SD) increase (95% credible interval (CrI) 1.08-1.57), drug crime OR = 1.18 per SD increase (95% CrI 0.94-1.46). The latter is borderline in terms of statistical significance as the CrI includes one. Spatial effects were well-identified (standard deviation 0.43, 95% CrI 0.07-0.91) although there was a relatively strong unstructured random effect also (standard deviation 0.47, 95% CrI 0.14-0.67).

Hepatitis C prevalence is highest in and around London, in the cities in the North West of England, and also some other larger cities, with a generally similar pattern to that seen

Table A1 Comparison of characteristics of data used in the model from the UAM Survey of PWID and the NTDMS.

	UAM Survey	NDTMS
Age		
15-24 years	633 (12.2%)	9,366 (15.1%)
25-34 years	2,140 (41.2%)	27,388 (44.2%)
35-44 years	1,845 (35.5%)	18,618 (30.0%)
45 years & over	574 (11.1%)	6,595 (10.6%)
Gender		
Male	3,979 (76.6%)	45,857 (74.0%)
Female	1,213 (23.4%)	16,110 (26.0%)
Years of use		
	Since first injection	Since first drug use
0-2 years	727 (14.0%)	7,263 (11.7%)
3-7 years	1,068 (20.6%)	12,203 (19.7%)
8-14 years	1,689 (32.5%)	22,593 (36.5%)
15 years & over	1,708 (32.9%)	19,908 (32.1%)

Total number of injectors for each year included in this analysis

2009	1,916 (36.9%)	*2008/09*	19,343 (31.2%)
2010	1,799 (34.6%)	*2009/10*	21,986 (35.5%)
2011	1,477 (28.4%)	*2010/11*	20,638 (33.3%)

Note: NDTMS data are for injectors in contact with treatment services between 2008 and 2011. As well as demographic information it shows the length of time between first use of drugs and entering treatment. The time lag between age of first use and entering treatment is typically eight years among dependent heroin users. This injecting group is not representative of the whole treatment population.

in the previous analyses looking at the period 2006 to 2008. However, prevalence in many more rural areas, most of which were previously in the 35% to 40% or 30% to 35% ranges, seems to have increased, with only a few areas with a prevalence below 35%.

The selection of areas surveyed by the UAM Survey tends to be largely the same from year-to-year, but some changes do occur and a number of areas were sampled in one, but not both, of the two periods 2006 to 2008 and 2009 to 2011. This provides the opportunity to assess the predictive ability of the spatial model, provided of course that prevalence remains roughly stable over short time periods. Eighteen areas fulfilled this criterion, with 12 sampled only in the 2009 to 2011 period and six sampled only in the 2006 to 2008 period. The median difference was 4.1%, although in two areas prevalence changed by more than 20%. These shifts are due to high observed prevalence in one time period compared to what was predicted by auxiliary variables and spatial effects in the non-sampled period. In general, the spatial modelling technique has been assessed previously via 'leave-one-out' cross-validation, and should provide robust estimates for the vast majority of local areas.

Further data are now available from the NDTMS on those in treatment, which may be used in different ways. These include data on crack use, crime and housing issues; psychological and physical wellbeing, quality of life; and duration of drug use. Further modelling work is required to validate the new data and methods. Duration of drug use is of particular interest, but assumptions are required in order to relate this to the duration of *injecting* drug use in the UAM Survey data. Initial analyses indicate that data on duration of injecting drug use does not substantially alter local level estimates, but does provide a modest improvement in precision of estimates (approximately 10% narrower credible intervals).