Estimates of Alcohol Dependence in England based on APMS 2014, including Estimates of Children Living in a Household with an Adult with Alcohol Dependence

Prevalence, Trends, and Amenability to Treatment

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Acknowledgements

Executive Summary

Background

1. The research team were previously commissioned by the Department of Health Policy Research Programme (PR-R4-0512-12002) to estimate the prevalence of adults potentially in need for specialist treatment for alcohol dependence in each Upper Tier Local Authority in England. The work used the Adult Psychiatric Morbidity Survey (APMS) 2007. This culminated in the development of the Specialist Treatment for Alcohol Model (STreAM).

2. The STreAM report also analysed amenability to treatment using the Alcohol Toolkit Study.

3. The team were also previously commissioned by Public Health England to estimate the number of children living in a household with an adult potentially in need of specialist treatment for alcohol dependence, at the national level. This built upon the STreAM model.

Objectives

1. Provide 2014-15 national and UTLA estimates of the number of adults that have a dependence on alcohol (including confidence intervals).

2. Provide 2014-15 national and UTLA estimates of the number of adults that have a dependence on alcohol that have children living with them (including confidence intervals).

3. Provide 2014-15 national and UTLA estimates of the number of children that live with adults that have an alcohol dependency (including confidence intervals).

4. Segment the three sets of estimates above, by age and gender (of the adult).

5. Provide trend data going back 5 years for the three sets of estimates above.

6. Provide an estimate nationally and for each UTLA of the number and proportion of adults dependent on alcohol that would be amenable to treatment in 2014-15.

7. Produce a report that explains the methodology used to produce the estimates as well as any caveats and limitation in their use.

Key Findings

Estimation of the Number of Adults with Alcohol Dependence

1. In estimating the prevalence of people with alcohol dependence potentially in need of specialist assessment and treatment, we followed NICE guidance which indicates that people screened as Alcohol Use Disorder Test (AUDIT) score 20+ can be classed as probably alcohol dependent. Further, a proportion of those scoring AUDIT 16-19 will have dependence severe enough to require specialist treatment.

2. Statistical analysis of 2014 APMS data, using an Ordered Probit model, shows that higher AUDIT score category (16-19 and 20+, compared with <16) is associated with: younger age and male gender, white ethnicity, living in area of greatest deprivation (compared to least), and living in area with higher regional rates of hospital admissions for alcohol dependence.

3. Statistical analysis of 2014 APMS data, using a separate Ordered Probit model, shows that higher Severity of Alcohol Dependence Questionnaire (SADQ) score category (4-15, 16-30, 31+, compared with 0-3) is associated with: higher audit score category, younger age and male gender, white ethnicity, and living in area of greatest deprivation (compared to least).

4. The above results, in combination with local population structure and hospital admission rates data, enable an estimation of the prevalence of alcohol dependence in each Upper Tier Local Authority in England, as well as nationally.

5. The basecase national point estimate of 2014-2015 prevalence of people with alcohol dependence potentially in need of specialist assessment and treatment is 595,131, which represents 1.393% of the 18+ population. This includes: 313,753 displaying mild dependence (0.73% with AUDIT 20+ and SADQ 4-15), 173,399 moderate dependence (0.41% AUDIT 16+ and SADQ 16-30), and 107,979 with severe dependence (0.25% AUDIT 16+ and SADQ 31+)

6. Probabilistic sensitivity analysis which accounts for the uncertainty in the estimated coefficients for each of the two Ordered Probit regression models shows a national level 95% confidence interval for the prevalence of people with alcohol dependence potentially in need of specialist assessment and treatment of 485,504 to 776,743 (which represents a range of 0.82 to 1.31 times the basecase point estimate).

7. The 2014-2015 national estimates of alcohol dependence are somewhat higher than the raw numbers in APMS multiplied by the population (1.393% based on the modelling versus and 1.155% based on the raw unadjusted APMS), because our estimates are adjusted for the factors identified in 2 and 3 above.

8. The 2014-2015 prevalence estimates are somewhat lower than those we previously generated using 2007 APMS data as part of the the DH-funded PRP project. The previous work estimated the 2012 prevalence at approximately 735,000 people in England. This is likely because the raw APMS 2014 data has slightly lower

numbers of people with alcohol dependence than were found in 2007. There were 82 people with an AUDIT score of 16 and more and an SADQ score of 16 or more, or an AUDIT score of 20 or more and an SADQ score of 4 or more, out of 7101 (1.155%) in 2014 versus 103 out of 7262 (1.418%) in 2007.

9. Alcohol dependence prevalence for 2014-15 has also been estimated for each of the 151 Upper Tier Local Authorities. There is an estimated sixfold difference between lowest and highest.

10. National and Local Authority trends in prevalence from 2009-10 to 2014-15 were calculated by applying the regression parameters to local annual population estimates and regional hospital admission rates. There is no discernible variation in prevalence across the years for any Local Authority.

Estimation of the Number of Adults that have a Dependence on Alcohol and have Children Living in the Household with them

11. Findings from statistical analysis of the APMS 2014 show significantly lower probability of living with a child (in the APMS 2014, this is anyone aged 18 in the household) if the respondent is dependent on alcohol.

12. However, the sample size is too small in the APMS to robustly estimate the true probability of living with children. We therefore use probability of living with children (under 18) from the National Drug Treatment Monitoring Service (NDTMS) for 2014-15 (sample size 174,046).

13. This is then compared to the Census snapshot (sample size >2 million) to give the relative rate of having children in the household. The census asks about dependent children aged under 18 living in the household.

14. The census data is used to estimate the probability of having children in the household given a respondent's age group, sex, deprivation status, and Government Office Region. The probability of having children in the household is adjusted for

adults with alcohol dependence depending on the relative rate calculated from NDTMS data.

15. We estimate that nationally in 2014-15 that of the 595,131 adults with alcohol dependence, there were an estimated 120,419 who have children living with them in the household. Accounting for the uncertainty in the coefficients estimated from the two Ordered Probit regressions for overall prevalence, the 95% confidence interval for the number of alcohol dependent adults living with children is 62,827 to 219,378.

16. Equivalent estimates at UTLA level have been calculated and will be published alongside UTLA level estimates for other substance misuse in forthcoming publication by PHE.

Estimation of the Number of Children Living with an Alcohol Dependent Adult

17. To estimate the number of children potentially affected, we account for the number of children living in the household using information from the Census. The expected number of children in the household (given that there are children in the household) is no different for adults with alcohol dependence, compared to those without.

18. 'Double-counting', whereby some of the alcohol dependent adults cohabit together with their children in the same household, is accounted for through analysis of the Health Survey for England. The probability that a male with alcohol dependence lives with another person with alcohol dependence is 9.62%.

19. We estimate that nationally in 2014-2015 there are 222,007 children living in a household with an adult who has symptoms of alcohol dependence and is potentially in need of specialist assessment and treatment.

20. We produce a slightly lower estimate if we adjust for 'double-counting'. The final,

revised estimate of the number of children living in a household with an adult who has symptoms of alcohol depedence and is potentially in need of specialist treatment is 207,617. This is calculated by adjusting the number of male adults with alcohol dependence in the household.

21. If we adjust the number of female adults with alcohol dependence in the household, we estimate that there are 189,119 children living with at least one alcohol dependent adult in the household.

22. This means that we estimate there to be between 14,390 and 32,887 children living with two adults with alcohol dependence.

23. Equivalent estimates at UTLA level have been calculated and will be published alongside UTLA level estimates for other substance misuse in forthcoming publication by PHE.

Amenability to Treatment - Estimation of the Number of Adults that have a Dependence on Alcohol who may be Amenable to Treatment

24. To estimate the number of people with alcohol dependence who may be amenable to treatment we used the Alcohol Toolkit Study dataset (March 2014 - July 2016) to identify motivation to reduce drinking among current drinkers categorised into three groups by AUDIT score (<16, 16-19, and 20+), with the latter group regarded as potentially dependent on alcohol

25. Two indicators of motivation to reduce alcohol use were identified: 'desire' to reduce drinking (within any timeframe) and 'intention' to reduce drinking (in the near future)

26. Statistical analysis of the data, using a logistic regression model, showed that desire to reduce drinking was associated with: female gender and being aged 35+ (compared to male gender aged 18-24), non-white ethnicity, region, and higher audit score category.

27. Intention to reduce drinking was also associated with each of the above AND: male gender and being aged 35-54 (compared to Male gender aged 18-24)

28. Neither desire nor intention to reduce drinking were associated with having children in the household

29. Overall, of the 634,329 people estimated to be alcohol dependent in England, we estimate 363,346 (57.3%) desire to cut down their drinking. This includes 261,288 people (41.2%) who intend to do so in the near future.

30. These percentage figures for desiring and intending to cut down are slightly higher than those based on an earlier analysis of the alcohol toolkit study (March 2014 - September 2015) in the STreAM report version 1.0 - 57.3% versus 51% for desire to cut down and 41.2% versus 33.2% respectively.

Chapter 1

Background

1.1 The Need for National and Local Prevalence Estimates of Alcohol Dependence

The work presented in this report builds upon previous work undertaken as part of a DH policy research programme grant on "An Evidence-Based Model for Estimating Requirements for Specialist Alcohol Treatment Capacity in England: The Specialist Treatment for Alcohol Model (STreAM)", project reference PR-R4-0512-12002. The work here supersedes the estimates for prevalence of alcohol dependence presented in that report by updating the analyses using APMS 2014 instead of APMS 2007 as the key data source.

Alcohol is the most commonly used psychoactive substance in the UK, with 58% of the population reporting drinking in the last week.[1] While many people drink alcohol without experiencing harms, at a population level, alcohol is responsible for a million hospitalisations and 6,500 deaths in England per year.[2] Overall, alcohol harms are estimated to cost £21B per year, including £3.5B in NHS costs.[2]

One form of alcohol-related harm, alcohol dependence, can be particularly costly in

personal, social, and economic terms. Alcohol dependence is a syndrome characterised by a strong and sometimes overpowering desire to drink, which may take priority over other previously valued activities.[3] In England, analysis of 2007 Adult Psychiatric Morbidity Survey (APMS) data indicated that 1.6 million people showed signs of alcohol dependence.[4] This estimate, while useful at a national level, is of limited value in local level planning of alcohol treatment service systems, with local areas having differing levels of alcohol dependence and population structures. Local Authorities assumed the lead responsibility for alcohol service provision in 2013/2014.[5] It is therefore crucial that decision-makers have locally relevant alcohol dependence prevalence estimates in order to understand the scale of need in their area. Such estimates could inform resource allocation to better address the longstanding geographic inequities in service provision for alcohol dependence[6].

1.2 The Need to Estimate the Number of Children Living with an Adult with Alcohol Dependence

Alcohol dependence not only affects the individual, but also has important consequences for those around them; particularly dependent children[7-9]. Children of parents with alcohol and other substance use problems are more likely than children in general to have a range of adverse childhood experiences such as being taken into in care, witnessing or be a victim of violence, and family separation[10]. Such children are also more likely to demonstrate behavioural problems[11] and perform less well at school[12]. In later life, they are at greater risk of themselves developing substance use or mental health problems[10].

To strategically address the needs of families where one or more adults in the household is alcohol dependent, it is necessary to understand how widespread this circumstance is. The Government has therefore commissioned Public Health England (PHE) to review the evidence and provide nationally and locally relevant advice on the number of chil-

dren affected by parental alcohol misuse.

Previous national estimates of the number of children living in households with alcohol dependent adults suggested this circumstance applies to 5.9% of children under 16 years (95% CI: 5.2-6.6) or approximately 705,611 individual children[13]. The estimates were calculated using year 2000 National Psychiatric Morbidity Study data, with respondents scoring >10 on the Alcohol Use Disorders Test (AUDIT)[14] and 16+ on the Severity of Alcohol Dependence Questionnaire (SADQ)[15] assumed to be alcohol dependent. The Social Mobility and Child Poverty Commission has since recommended monitoring the number of children living with alcohol dependent adults over time as an indicator of chronic disadvantage[16]. As data from the 2014 Adult Psychiatric Morbidity Survey have recently become available, it is now possible to provide updated national estimates of the number of children living with alcohol dependent adults and, for the first time, to develop a method for providing local level estimates and to examine trends over time.

1.3 Developing a New Method for Local Prevalence Estimates of Alcohol Dependence

In 2014, a consortium including the University of Sheffield, King's College London, and the University of Manchester were commissioned by the Department of Health to undertake an evidence review and synthesis in order to build an alcohol treatment capacity model. Of particular relevance to this report, the project included (for England and each Local Authority) the development of new prevalence estimates for alcohol dependence. Other aspects of the project involved quantification of specialist alcohol treatment pathways and estimates of access rates to specialist alcohol treatment, treatment outcomes, and costs. These data, along with the prevalence estimates, were embedded within two decision support tools for the planning and commissioning of specialist alcohol services: a benchmarking tool to allow Local Authorities to compare themselves to other areas and the national average, and a 'what if' scenario modelling tool to allow

users to determine the potential consequences of altering the level and mix of specialist services provided in terms of numbers treated, resource use, prevalence, mortality and costs. This work is fully described in the project report *An Evidence-Based Model for Estimating Requirements for Specialist Alcohol Treatment Capacity in England: The Specialist Treatment for Alcohol Model (STreAM) Version 1.0*[17].

The prevalence estimation aspect of the work involved deriving population distributions of mild moderate, and severe alcohol dependence for each of 151 Upper Tier Local Authorities (UTLA) in England. The analysis utilised:

- Data from the 2007 APMS[4] - specifically AUDIT and SADQ scores (to indicate harmful drinking and to classify severity of alcohol dependence respectively)

- Local Authority population data - age, gender, and Index of Multiple Deprivation (IMD) quintile[18]

- Hospital admission rates - for alcohol dependence or withdrawal as denoted by ICD-10 diagnosis codes F10.2, F10.3, F10.4, F10.5, or F10.6[3] for each of nine Government Office Regions (with individual UTLA admission rates assumed to be the same as the GOR within which they were located)

The statistical modelling used is described in detail in Chapter 4 of the project report[17], but in short, two Ordered Probit regression models were fitted to APMS data. The first explored the association between AUDIT scores (0-7, 8-15, 16-19, 20+) on the one hand and individual (age and gender) and area (IMD and hospital admission rates,) characteristics on the other. The results of the first model were then used to estimate the probability of being in an SADQ score group (0-3, 4-14, 16-30, 31+) on the basis of not only age, gender, IMD and hospital admission rate, but also conditional on AUDIT category. The parameters of the first regression we used to estimate the distribution of AUDIT scores for each Local Authority in 40 subgroups (2 x gender, 4 x age, 5 x IMD quintile). The number of people in each subgroup estimated to be in each AUDIT category was then further partitioned into SADQ categories, using the regression coefficients of the

4

second model. Finally, adjustment was made to Local Authority prevalence estimates to reflect homelessness, on the basis that people who were homeless were less likely to be included in the APMS data but more likely to be alcohol dependent.

Nationally, we estimated that in 2012 approximately 735,000 (1.75% of the 18+ population) are alcohol dependent and likely to be in need of specialist treatment. When considered by severity, 397,000 were estimated to be mildly dependent (0.94%: AUDIT 20+ and SADQ 4-15), 268,000 moderately dependent (0.64%: AUDIT 16+ and SADQ 16-30), and 52,000 severely dependent (0.12%: AUDIT 16+ and SADQ 31+). Estimates by Local Authority can be found in Appendix 4.6 of the report[17]. A limitation of the estimates is the age of the data on which they were based, however, at the time the work was conducted the 2014 APMS data were not available for use. Updating the estimates with new data was identified as a priority by the project team and stakeholders.

1.4   Amenability to Treatment

While information about the number of people within an area who may be alcohol dependent can assist those responsible for commissioning alcohol services in understanding how many could potentially require specialist treatment, such information does not indicate what proportion of these would be willing to actually access treatment if it were available (i.e. 'amenable' to treatment). There is ample evidence to suggest that not all of those who could potentially benefit will necessarily seek treatment or perceive the need for it, and further, some will remit from alcohol dependence without formal intervention.[19-21] For these reasons, it would not be a good use of scarce resources to provide enough treatment for the entire alcohol dependent population; rather it is necessary to have an indication of the proportion who might be amenable to treatment at a given time and to scale service provision accordingly. For a number of years, the commonly accepted 'rule of thumb' in England has been that there should be sufficient capacity for 15% of the prevalent population. This proportion is based on the 1990 work of Rush[22] which has been taken to suggest that treatment services should aim to

cater for 10-20% of the prevalent population. As an amenability estimate using Canadian work conducted several years ago may not be relevant to the contemporary English context, the development of a new method for estimating the amenability was also commissioned as part of the *STreAM* project.[17]

We used Alcohol Toolkit Study data[23] to calculate alcohol treatment amenability estimates for people who were possibly alcohol dependent (i.e. AUDIT score 20+) for eight groups (male and female, each by age groups: 18-24, 25-34, 35-54, and 55+ years). Amenability to treatment was assessed using a single item regarding motivation to reduce drinking, with responses indicating whether or not a person (1) had a desire to cut down, and (2) had a desire to cut down and intended to do so soon - see the *STreAM* report[17] for complete description of methods. Overall, 51% of those scoring 20+ on AUDIT had a desire to cut down and 33.2% intended to do so soon. While these estimates take into account age and gender, they are national rather than local, and do not account for local variation in factors such as IMD and ethnicity.

1.5 Aims and Objectives

The overall aim of this project is to provide national and local estimates for England of the number of adults dependent on alcohol and how many have children living with them. These estimates are intended for use by Local Authorities to assess the need for alcohol treatment provision.

This aim will be addressed by meeting the following objectives:

1. Provision of 2014/15 estimates of the number of **adults** that have a **dependence on alcohol** (including confidence intervals)

   - nationally and by UTLA

   - by age and gender (of the adult)

   - from 2010/11 to 2014/15

2. Provision of 2014/15 national and UTLA estimates of the number of **adults** that have an alcohol dependency that have **children living with them** (including confidence intervals)

   - nationally and by UTLA

   - by age and gender (of the adult)

   - from 2010/11 to 2014/15

3. Provision of 2014/15 national and UTLA estimates of the number of **children that live with adults** that have an alcohol dependency (including confidence intervals)

   - nationally and by UTLA

   - by age and gender (of the adult)

   - from 2010/11 to 2014/15

4. Provision of an estimate nationally and for each UTLA of the number and proportion of adults dependent on alcohol that would be **amenable to treatment** in 2014/15

5. Production of a report that explains the **methodology** used to produce the estimates as well as any **caveats and limitations** in their use

Chapter 2

Prevalence of Alcohol Dependence in Adults by Local Authority

2.1 Introduction

The first substantive work package of this project is to estimate the prevalence of adults with alcohol dependence nationally and by Upper Tier Local Authority[1]. This is an update to Brennan et al (2016), using the Adult Psychiatric Morbidity Survey (APMS) 2014, rather than the APMS 2007. Estimates are generated for 8 different age-sex groups: 18-24, 25-34, 35-54 and 55+; male and female. Estimates are also generated for 5 financial years: 2010-11, 2011-12, 2012-13, 2013-14 and 2014-15.

This work tests several different model structures to check for 'structural uncertainty' - uncertainty arising due to model choice. The original estimates did not include confidence intervals. Therefore, we run Monte-Carlo simulation of the regression parameters to calculate confidence intervals around the estimates.

We estimate there to be 595,131 adults (1.393%) with alcohol dependence in England

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[1] This report uses Upper Tier Local Authority, its acronym UTLA, and Local Authority, interchangably throughout.

in 2014-15. There is substantial variation across age and sex, with over 3% of males aged 25-34 estimated to have alcohol dependence compared to 0.26% of females aged 55 and over. We also find large variation in rates of alcohol dependence across Upper Tier Local Authorities, ranging from 0.64% in Wokingham to 3.85% in Blackpool. The confidence interval around the central estimate is large, with a 95% confidence interval of 485,504 to 776,743.

2.2   Data and Methods

The estimation is based upon the APMS 2014, which is a nationally-representative cross-sectional survey of 7,546 individuals in private accommodation aged 16 or over. The APMS includes demographic information including age, sex, ethnicity, and index of multiple deprivation (IMD) quintile, and the Government Office Region (GOR) of residence. The APMS also includes two screening tools pertinent to this research: the Alcohol Use Disorders Identification Test (AUDIT) and the Severity of Alcohol Dependence Questionnaire (SADQ). Respondents are grouped according to their scores on both questionnaires to give twelve combinations, based on three AUDIT groups and four SADQ groups, as shown in Table 2.1. Those in the yellow cells are deemed potentially in need of specialist treatment for alcohol dependence[2], and are the focus of this work.

Table 2.1: Example AUDIT-SADQ Matrix

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	A	B	C	D	E
AUDIT 16-19	F	G	H	I	J
AUDIT 20+	K	L	M	N	O
Total	P	Q	R	S	T

The probability of belonging in each of the cells is estimated as a function of age group,

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[2]See the original *STreAM* report for more explanation.

sex, ethnicity, IMD quintile, and 2014-15 alcohol-dependent hospital admissions rate for the Government Office Region (GOR) the respondent lives within. There are 9 Government Office Regions in England: North East, North West, Yorkshire & the Humber, East Midlands, West Midlands, East of England, London, South East, South West. The admission rates are taken from Hospital Episodes Statistics data. The alcohol-dependent hospital admissions rate used is the "unique patients admitted with diagnosis codes F10.2, F10.3, F10.4, F10.5 or F10.6".

Each respondent in the APMS is allocated a HES rate based on their age group, sex, and GOR. That is, we expect the probability of belonging to an AUDIT or SADQ group to be related to the GOR-level alcohol-attributable and alcohol-dependent hospital admissions rates. The probability of belonging to a particular AUDIT group is estimated as a function of age, sex, IMD quintile, ethnicity, and hospital admissions rate. The probability of belonging to a particular SADQ group is estimated as a function of the same explanatory variables, as well as AUDIT group. That is, we expect the probability of a respondent belonging to an SADQ group to be dependent on their AUDIT group. Estimated probabilities are multiplied by the population taken from the relevant year's mid-year population estimate, provided by the Office for National Statistics.

The probabilities are estimated using 2 different regression models to test for structural uncertainty (ie. different results due to model choice). First, two separate Ordered Probit models are chosen. A second model is estimated using two Multinomial Logistic Regressions, which estimates the probability of belonging to each cell in the matrix assuming no underlying ordinal structure. After detailed analysis, the two separate Ordered Probit models were chosen on the grounds of goodness of fit, as well as a statistical test which showed that the Bivariate Ordered Probit, which assumes correlation in the error terms of the two Ordered Probit equations, is not necessary. Details for the other models tested and their goodness of fit are given in Appendix 1.

The Ordered Probit regression assumes an underlying linear dependent variable y^* determined by

$$y_i^* = \mathbf{x_i}\beta + \varepsilon_i$$

and cut points are endogenously chosen such that

$$y_i = 1 \quad \text{if} \quad y^* \leq \alpha_1$$
$$y_i = 2 \quad \text{if} \quad \alpha_1 < y^* \leq \alpha_2$$
$$y_i = j \quad \text{if} \quad y^* > \alpha_j$$

where y_i is the observed outcome - in this case the AUDIT or SADQ group. The Ordered Probit assumes that the error term ε_i is normally distributed with mean zero. The probability of belonging to each group, dependent on characteristics, can then be calculated. For example

$$P(y_i = 1|x_i) = P(y_i^* \leq \alpha_1|x_i) = P(\mathbf{x_i}\beta \leq \alpha_1|x_i) = \Phi(\alpha_1 - \mathbf{x_i}\beta)$$

2.3   Results

2.3.1   Raw APMS matrix

Table 2.2 shows the raw, weighted matrix from the APMS 2014. There are 7,101 observations due to either missing data in one or more of the variables or age being less than 18, for 445 respondents.

The raw data shows that 1.15% of the respondents are adults potentially in need of specialist treatment for alcohol dependence. The majority (64.6%) of these are considered to have mild dependence (SADQ 4-15).

Table 2.2: Raw APMS Matrix (weighted)

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	6,632	244	9	0	6,884
AUDIT 16-19	53	71	4	0	128
AUDIT 20+	11	53	13	12	89
Total	6,695	368	26	12	7,101
Total with alcohol dependence:	82				
As percentage of population:	1.155%				

2.3.2 Regression Results

Table 2.3 and Table 2.4 show the regression parameters from the Ordered Probit regressions for AUDIT and SADQ respectively. Although the coefficients are not marginal effects (in that the magnitude has no immediately discernible meaning), the direction of the coefficients is revealing.

Females across all age groups are less likely to be in a high AUDIT group compared to 18-24 year-old males. White respondents are more likely to be in a higher AUDIT group than non-white respondents. IMD is not statistically significantly related to AUDIT group except for the richest quintile, who are much less likely to have a high AUDIT score. Alcohol-dependent hospital admissions rates are not statistically significant at the 10% level, although this might be due to small variation and sample size. The coefficient is in the expected direction, in that people in areas with higher alcohol-dependent hospital admission rates are more likely to have a higher AUDIT score.

Older age groups are less likely to be in higher SADQ groups, as are non-whites and the richest IMD quintile. No other IMD quintile is significantly different from the most deprived quintile. Hopsital admissions rates are significant predictors of SADQ group at the 10% level, and again the coefficient means that respondents in areas with higher alcohol-dependent hospital admission rates are more likely to have a higher SADQ score. SADQ group is mostly affected by which AUDIT group the respondent is in.

Table 2.3: Regression Parameters: Ordered Probit, AUDIT

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	-0.226
		(0.211)
	25-34 Male	0.066
		(0.189)
	25-34 Female	-0.427
		(0.185)**
	35-54 Male	-0.113
		(0.230)
	35-54 Female	-0.491
		(0.179)***
	55+ Male	-0.586
		(0.215)***
	55+ Female	-0.764
		(0.178)***
Ethnicity	White	(ref)
		-
	Non-White	-0.242
		(0.118)**
IMD quintile	1 (Poorest)	(ref)
		-
	2	0.025
		(0.094)
	3	-0.132
		(0.099)
	4	-0.084
		(0.098)
	5 (Richest)	-0.304
		(0.110)***
Hospital Admissions Rates	Alcohol-Dependence	66.651
		(47.563)
Cut Points	1	1.284
		(0.216)***
	2	1.672
		(0.218)***
N		7,101

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

Table 2.4: Regression Parameters: Ordered Probit, SADQ

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	0.022
		(0.177)
	25-34 Male	-0.071
		(0.174)
	25-34 Female	-0.322
		(0.162)**
	35-54 Male	-0.352
		(0.216)
	35-54 Female	-0.597
		(0.164)***
	55+ Male	-0.848
		(0.202)***
	55+ Female	-0.912
		(0.163)***
Ethnicity	White	(ref)
		-
	Non-White	-0.606
		(0.137)***
IMD quintile	1 (Poorest)	(ref)
		-
	2	0.018
		(0.090)
	3	-0.023
		(0.091)
	4	-0.144
		(0.095)
	5 (Richest)	-0.202
		(0.101)**
Hospital Admissions Rates	Alcohol-Dependence	89.203
		(45.631)*
Audit Group	<16	(ref)
		-
	16-19	1.922
		(0.115)***
	20+	2.998
		(0.153)***
Cut Points	1	0.810
		(0.214)***
	2	2.515
		(0.241)***
	3	3.215
		(0.274)***
N		7,101

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$

2.3.3 Matrices from Statistical Analysis

Table 2.5 shows the overall matrix for England. The main estimate for the number of adults in England with alcohol dependence is 595,131, which is 1.393% of the adult population.

Table 2.5: National AUDIT-SADQ Matrix

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	39,800,500	1,420,261	11,810	887	41,233,459
AUDIT 16-19	362,830	428,456	50,940	15,761	857,987
AUDIT 20+	65,844	337,505	131,968	98,154	633,471
Total	40,229,173	2,186,223	194,718	114,802	42,724,917
Total with alcohol dependence:	595,131				
As percentage of population:	1.393%				

This is broken down into eight separate matrices by age and gender in Table 2.6 to Table 2.13. There is considerable variation across age and gender: males are much more likely to have alcohol dependence, especially those aged 25-54. The highest prevalence of alcohol dependence in females is in the youngest age group, 18-24.

Table 2.6: Male 18-24

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	8168952	78959	221	10	8248142
AUDIT 16-19	35502	17548	842	144	54036
AUDIT 20+	6863	16086	3005	1179	27133
Total	8211317	112593	4068	1333	8329311
Total with alcohol dependence:	59,382				
As percentage of population:	2.362%				

Table 2.7: Male 25-34

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	3214997	229234	2446	198	3446875
AUDIT 16-19	47900	79313	11434	3823	142470
AUDIT 20+	8018	58132	27379	22636	116165
Total	3270915	366679	41259	26657	3705510

Total with alcohol dependence:	123,404
As percentage of population:	3.330%

Table 2.8: Male 35-54

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	6437927	391937	3958	321	6834143
AUDIT 16-19	94085	142370	19457	6452	262364
AUDIT 20+	16263	108091	48308	39095	211757
Total	6548275	642398	71723	45868	7308264

Total with alcohol dependence:	221,404
As percentage of population:	3.029%

Table 2.9: Male 55+

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	7022143	128290	562	30	7151025
AUDIT 16-19	55231	40002	2798	609	98640
AUDIT 20+	10629	35156	8955	4506	59246
Total	7088003	203448	12315	5145	7308911

Total with alcohol dependence:	52,024
As percentage of population:	0.712%

Table 2.10: Female 18-24

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	2178580	150632	1535	121	2330868
AUDIT 16-19	15859	25965	3644	1187	46655
AUDIT 20+	2139	15440	7148	5757	30484
Total	2196578	192037	12327	7065	2408007

Total with alcohol dependence: 33,176
As percentage of population: 1.378%

Table 2.11: Female 25-34

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	3507225	129744	863	56	3637888
AUDIT 16-19	23074	25213	2495	653	51435
AUDIT 20+	3591	17418	5995	3754	30758
Total	3533890	172375	9353	4463	3720081

Total with alcohol dependence: 30,315
As percentage of population: 0.815%

Table 2.12: Female 35-54

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	7101956	169388	847	48	7272239
AUDIT 16-19	51729	43476	3407	778	99390
AUDIT 20+	9181	34849	9851	5284	59165
Total	7162866	247713	14105	6110	7430794

Total with alcohol dependence: 54,170
As percentage of population: 0.729%

Table 2.13: Female 35-54

	SADQ 0-3	SADQ 4-15	SADQ 16-30	SADQ 31+	Total
AUDIT 0-15	8168952	78959	221	10	8248142
AUDIT 16-19	35502	17548	842	144	54036
AUDIT 20+	6863	16086	3005	1179	27133
Total	8211317	112593	4068	1333	8329311

Total with alcohol dependence:	21,256
As percentage of population:	0.255%

2.3.4   Dependence Rates by Local Authority

Prevalence estimates were generated for each Upper Tier Local Authority in England, giving 151 subnational estimates[3]. Local variation is driven by both demographic variation (for example, some Local Authorities have more 35-54 males who are more likely to have alcohol dependence) and by the local area hospital admissions - UTLA-specific F10 admissions.

The estimates show substantial variation across Local Authorities, with dependence rates ranging from 0.64% in Wokingham to 3.85% in Blackpool. The results are shown in Figure 2.1. Full tables can be found in the appendix to this report. Results for each Local Authority, broken down into 8 age-sex groups, can be found in the supplementary Excel appendix file.

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[3]Cornwall and Scilly Isles were merged to form a single UTLA.

Figure 2.1: Estimated % Overall Prevalence of Alcohol Dependence in 151 English Local Authorities

2.4 Modelling Uncertainty and Confidence Intervals

2.4.1 Structural Uncertainty

Structural uncertainty, which covers the uncertainty generated by choosing a particular regression model and coefficients, was tested by experimentation of different regression models and the inclusion and exclusion of variables. Three alternative regression models were used: a two-stage Multinomial Logistic Regression, a single Multinomial Logistic Regression which estimated AUDIT and SADQ groups simultaneously, and a Bivariate Ordered Probit. The two-stage Multinomial Logistic Regression yielded very similar results (estimate of 618,031). The single Multinomial Logistic Regression yielded similar, albeit slightly higher, national estimates of the number of adults with alcohol dependence (estimate of 658,292). The Bivariate Ordered Probit, which is required when the two error terms from the AUDIT and SADQ regressions are correlated, showed that the error terms are not correlated. Because of this, and to aid comparison with previous work, the two-stage Ordered Probit was chosen.

Regarding the inclusion and exclusion of explanatory variables, there were 3 sets of explanatory variables tested. These were: alcohol-dependence-related hospital admissions rate only; alcohol-dependence and alcohol-attributable admissions rates; and both hospital admissions rates plus mortality rates. It was shown in all regression models that adding alcohol-attributable admissions and mortality did not improve model fit, and due to colinearity were dropped from the final model.

2.4.2 Monte-Carlo Simulation

Confidence intervals for prevalence estimates were calculated through Monte-Carlo simulation, which took 1000 random draws of the regression parameters using the variance-covariance matrix to allow for the correlation between parameters. The top and bottom 2.5% of the simulated estimates were cut to give the 95% confidence inter-

val. Figure 2.2 shows the distribution of national population estimates of adults with alcohol dependence.

Figure 2.2: Simulation Estimates - National
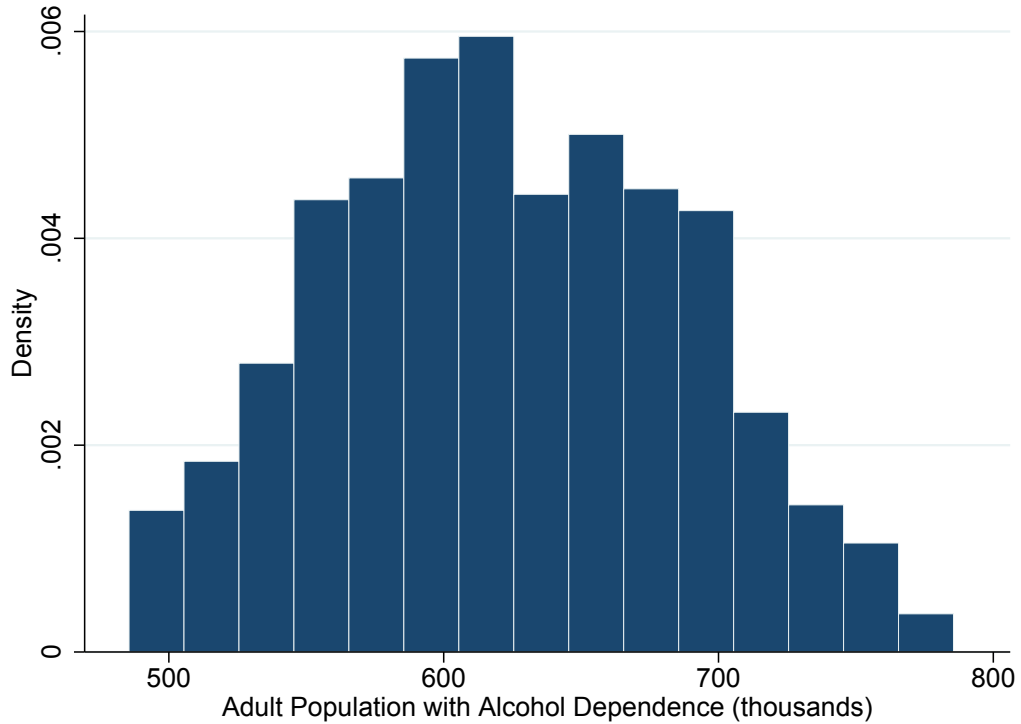
Similar Monte-Carlo simulation was carried out for each Upper Tier Local Authority. The results are presented in Figure 2.3. Although the confidence intervals overlap, this does not necessarily mean that the differences between Local Authorities is not significant. This is because the Monte-Carlo simulations use a random draw from coefficients and apply them to all Local Authorities. That is, if the parameter estimate for alcohol-dependence hospital admissions rate is high for one UTLA, it is high for all UTLAs. Therefore, for each simulation, the ordering of Local Authorities is more stable than it may seem at first.

Figure 2.3: Monte-Carlo Confidence Intervals for UTLA
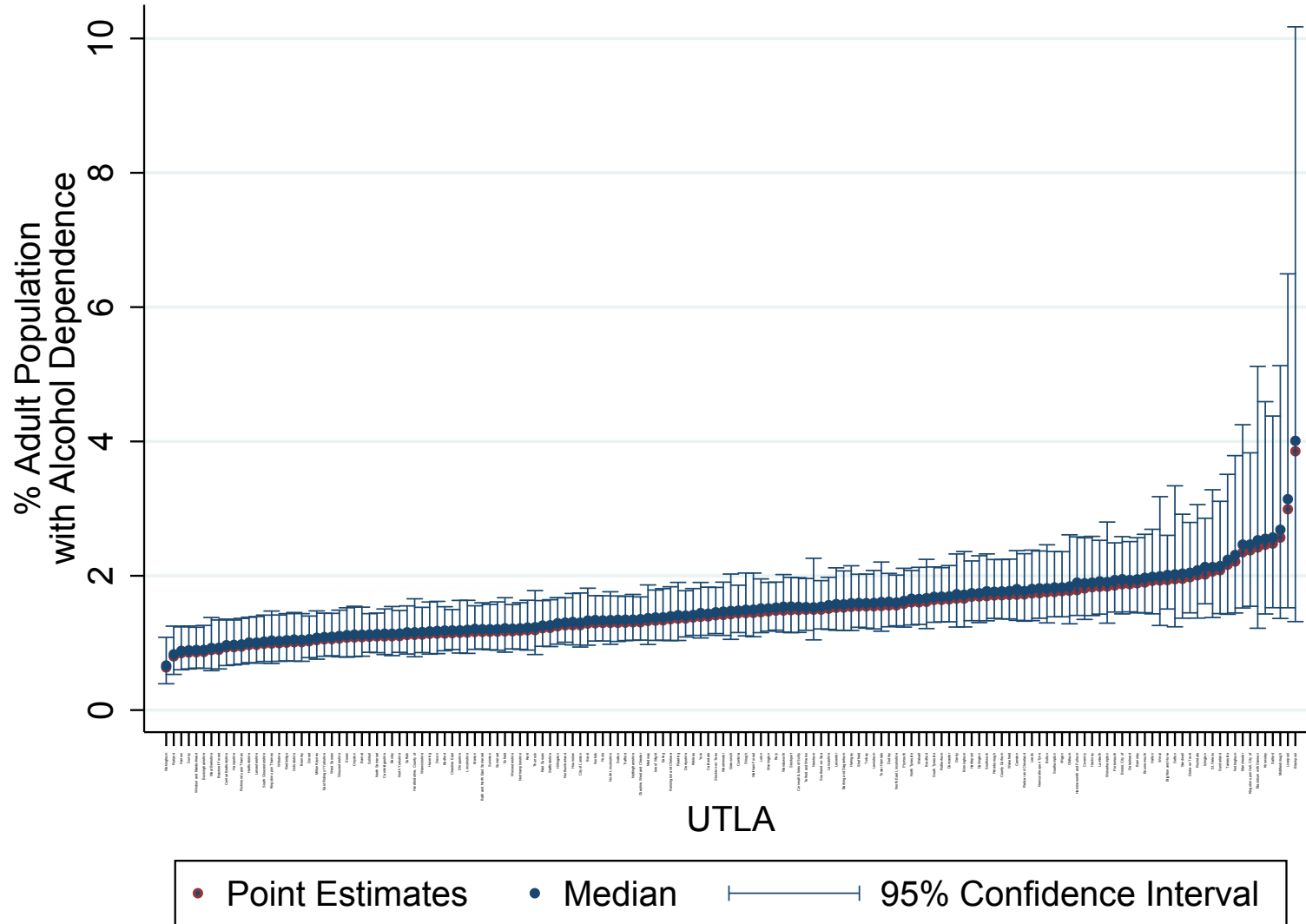
2.5 Trends

The overall prevalence rate for England is very stable, as shown in Figure 2.4. The trend follows the trend in F10 hospital admissions, which is expected given the positive relationship between F10 admissions and estimated alcohol dependence prevalence.

Prevalence estimates are calculated for each Local Authority for the previous 5 years (including 2014-15), by applying the regression parameters to the relevant year's population estimate and hospital admissions rates. These are presented in Figure 2.5. The results are very stable across years for all Local Authorities apart from City of London, which has very variable F10 admissions.

Figure 2.4: National Prevalence Estimates - Trends
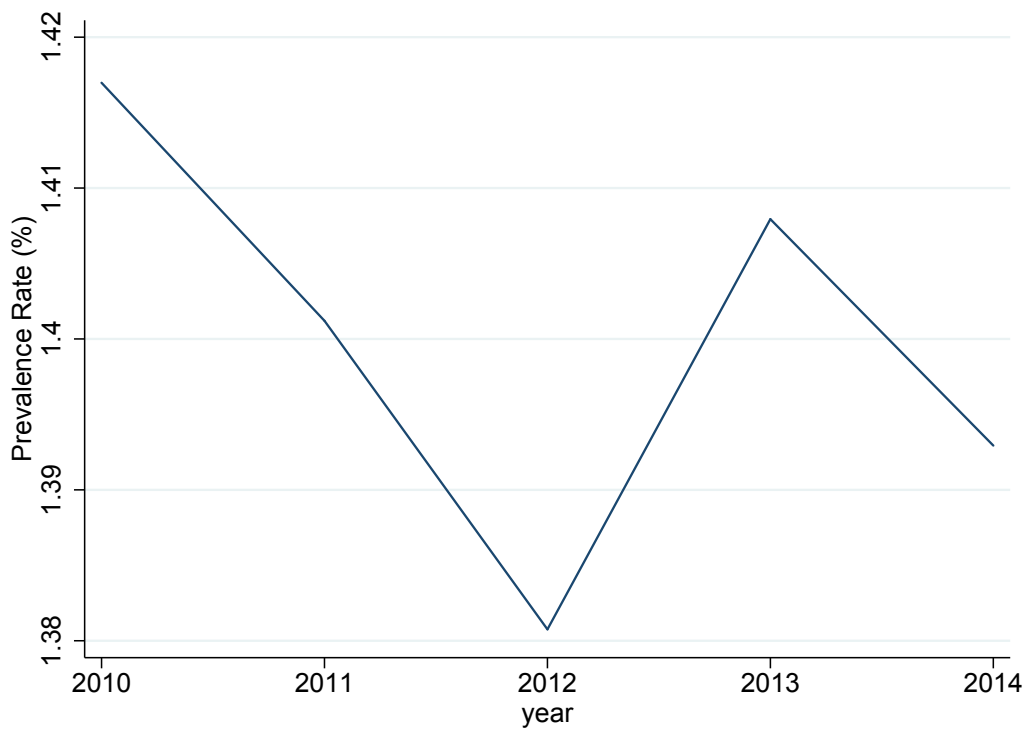
Figure 2.5: 5 Year Prevalence Estimates
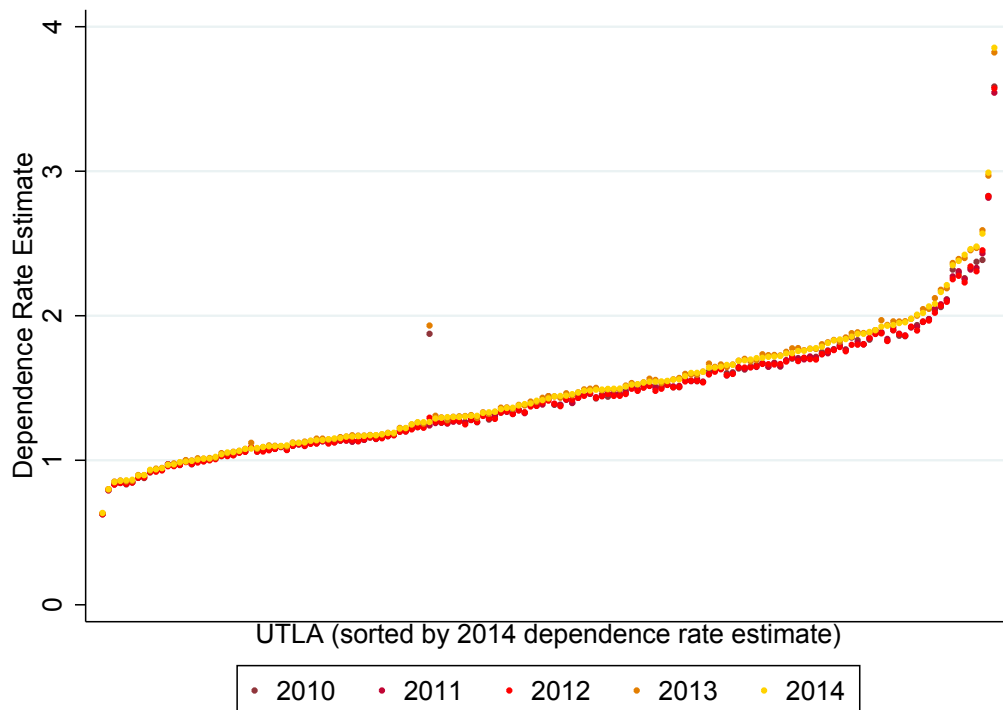
2.6 Conclusions

This chapter has estimated the prevalence of alcohol dependence in adults in England. It estimates that there are 595,131 adults in England, with a 95% confidence interval ranging from 485,504 to 776,743. There is also estimated to be large variation across Local Authorities, ranging from 0.64% to 3.85%.

Chapter 3

Prevalence of Parental Alcohol Dependence and Estimates of the Number of Children Living with Parents with Alcohol Dependence

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3.1 Introduction

The second work package estimates the prevalence of *parental* alcohol dependence, which is to say the prevalence of adults with alcohol dependence living with children in the household. Therefore 'parental' in this chapter refers to living arrangement rather than biological parent. This work estimates two main outputs - the number of adults with alcohol dependence living with children, and the number of children living with adults with alcohol dependence. The latter allows for 'double-counting', whereby some of the children may live with two adults with alcohol dependence.

3.2 Data and Methods

We used three different sources of data to investigate the probability that the people with alcohol dependence have children living with them, and the number of children if they do.

1. APMS 2014, which has a sample size of 7,101 and an unweighted alcohol-dependent population of 77.

2. NDTMS 2014/15, which consists of 87,023 people undergoing specialist treatment for alcohol dependence in England.

3. A census 2011 snapshot, with a sample size of over 3 million.

Whilst it might be preferential to take the direct estimate of the probability of having children, and the expected number of children, from the APMS, there are two drawbacks. The first is that the APMS is not a household survey, and as such does not have information on the respondent's partner's drinking. The second is that the sample (n=77) is too small to robustly estimate the number of children in each house. For this reason, a detailed census 'snapshot', available from through UK Data Service, of over 3 million people is used.

The basis for the estimates is the AUDIT-SADQ matrices generated in Chapter 2 for each Local Authority, broken down by the 8 age-sex groups. For each cell in these matrices, within each Upper Tier Local Authority, we estimate the number of these adults that are living with children, and then the number of children.

3.2.1 The Number of Adults with Alcohol Dependence with Children

The probability of living with children is estimated for each age-sex group controlling for ethnicity, IMD, and government office region. This is estimated using a logistic regression, with the census results presented in Table 3.1.

We undertook an exploration of the APMS 2014 data to investigate whether there was evidence that people with alcohol dependence have a different probability of having

children living with them when compared to those without alcohol dependence. Table 3.3 shows that the probability of having children in the house is different for adults with alcohol dependence, with an odds ratio for people who are not dependent of 2.76 (95% CI = 1.04, 4.48). This needs to be accounted for. However, the APMS is not a large enough sample to reliably estimate the number of children in the household.

Data from the National Drug Treatment Monitoring Service (NDTMS) is used to adjust the probability of having children in the house for adults with alcohol dependence. The ratios presented in Table 3.5 are used to adjust the probability of having children in the house for adults with alcohol dependence. Table 3.5 shows that the probability of having children in the household is lower for adults with dependent drinkers in the three youngest age categories. Males are less likely than females to have children in the house across all age ranges.

In summary, the steps to estimate the number of people with alcohol dependence who have one or more children living with them are: (a) estimate the number of people with alcohol dependence in each Local Authority for each age-gender group, (b) estimate, from census data, the probability of having children in the house, (c) adjust the probabilities for adults with alcohol dependence using the ratios in Table 3.5.

3.2.2 The Number of Children living with Adults with Alcohol Dependence

The basis for these estimates is also the AUDIT-SADQ matrics estimated in Chapter 2 and the census snapshot. Again, the APMS is used to test whether adults with alcohol dependence have fewer children living in the household, controlling for all other factors through OLS regression. The results are presented in Table 3.4 and show that there is no evidence that the number of children in the household, conditional on there being any children in the household, differs significantly for those with alcohol dependence compared to those without. We therefore use the same expected number of children

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from the census snapshot, presented in Table 3.2.

Double-counting, whereby a child living with two adults with alcohol dependence is 'claimed' by both adults, is addressed using the Health Survey for England 2014. Because the Health Survey for England does not have information on AUDIT or SADQ, we use the proportion of two-adult households where both adults are in the top 1.485% of drinkers[1] to proxy for two adults with alcohol dependence living together.

3.3 Results

3.3.1 Regression Results

The regression results from the census snapshot are presented in Table 3.1 and Table 3.2. The regression parameters all seem sensible: females have a higher odds ratio than males, non-white respondents have a higher probability of having children in the household, and there is significant variation across Government Office Regions with the highest odds ratios being in East of England and West Midlands, and the lowest being in London.

The regression results from the APMS are presented in Table 3.3 and Table 3.4. The regressions show that adults with alcohol dependence are less likely to have children in the household, controlling for other explanatory variables. Adults without alcohol dependents are significantly more likely to have children in the household than adults with alcohol dependence. However, conditional on having children in the house, the number of children in the house does not differ with relation to alcohol dependence.

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[1]1.485% is our central estimate of the proportion of the adult population with alcohol dependence, as shown in Table 2.5.

Table 3.1: Results of Logistic Regression for the Probability of Having Children in the Household within the General Population

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	1.324
		(0.011)***
	25-34 Male	0.979
		(0.008)**
	25-34 Female	2.326
		(0.018)***
	35-54 Male	2.206
		(0.016)***
	35-54 Female	2.946
		(0.021)***
	55+ Male	0.132
		(0.001)***
	55+ Female	0.054
		(0.001)***
Ethnicity	White	(ref)
		-
	Non-White	1.668
		(0.008)***
IMD quintile	1 (Poorest)	(ref)
		-
	2	1.036
		(0.027)
	3	1.219
		(0.031)***
	4	1.289
		(0.032)***
	5 (Richest)	1.579
		(0.039)***
Government Office Region	North East	(ref)
		-
	North West	1.014
		(0.009)
	Yorkshire & the Humber	0.995
		(0.010)
	East Midlands	0.994
		(0.010)
	West Midlands	1.059
		(0.010)***
	East of England	1.059
		(0.010)***
	London	0.733
		(0.007)***
	South East	1.020
		(0.009)**
	South West	0.976
		(0.009)**
N		2,068,980

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Odds Ratios. Data Source: 2011 Census Snapshot.

Table 3.2: Results of OLS Regression for the Expected Number of Children in the Household within the General Population)

Age-Sex	18-24 Male	(ref) -
	18-24 Female	-0.031 (0.006)***
	25-34 Male	0.176 (0.006)***
	25-34 Female	0.288 (0.005)***
	35-54 Male	0.365 (0.005)***
	35-54 Female	0.306 (0.005)***
	55+ Male	-0.117 (0.008)***
	55+ Female	-0.332 (0.010)***
White	White	(ref) -
	Non-White	0.199 (0.003)***
IMD quintile	1 (Poorest)	1.000 (0.000)
	2	-0.031 (0.017)*
	3	-0.106 (0.016)***
	4	-0.163 (0.016)***
	5 (Richest)	-0.223 (0.016)***
Government Office Region	North East	1.000 (0.000)
	North West	0.045 (0.006)***
	Yorkshire & the Humber	0.066 (0.006)***
	East Midlands	0.044 (0.006)***
	West Midlands	0.064 (0.006)***
	East of England	0.077 (0.006)***
	London	0.015 (0.006)***
	South East	0.082 (0.005)***
	South West	0.082 (0.006)***
N		2,068,980

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Constant suppressed from table. Data Source: 2011 Census Snapshot.

Table 3.3: Results of Logistic Regression for the Probability of Having Children in the Household Differentiating between With and Without Alcohol Dependence

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	1.528
		(0.321)**
	25-34 Male	1.374
		(0.279)
	25-34 Female	3.575
		(0.657)***
	35-54 Male	1.888
		(0.339)***
	35-54 Female	2.939
		(0.511)***
	55+ Male	0.075
		(0.018)***
	55+ Female	0.055
		(0.013)***
Ethnicity	White	(ref)
		-
	Non-White	1.556
		(0.155)***
IMD quintile	1 (Poorest)	(ref)
		-
	2	0.968
		(0.098)
	3	0.973
		(0.099)
	4	0.950
		(0.099)
	5 (Richest)	1.178
		(0.125)
Government Office Region	North East	(ref)
		-
	North West	0.790
		(0.132)
	Yorkshire & the Humber	0.379
		(0.069)***
	East Midlands	0.751
		(0.132)
	West Midlands	0.725
		(0.123)*
	East of England	0.671
		(0.116)**
	London	0.496
		(0.085)***
	South East	0.716
		(0.119)**
	South West	0.460
		(0.082)***
Alcohol Dependence	Alcohol Dependent	(ref)
		-
	Not Alcohol Dependent	2.761
		(0.876)***
N		7,101

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Odds Ratios. Data Source: APMS 2014.

Table 3.4: Results of OLS Regression for the Expected Number of Children in the Household Differentiating between With and Without Alcohol Dependence)

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	-0.040
		(0.149)
	25-34 Male	0.327
		(0.146)**
	25-34 Female	0.516
		(0.129)***
	35-54 Male	0.402
		(0.129)***
	35-54 Female	0.303
		(0.125)**
	55+ Male	0.008
		(0.186)
	55+ Female	-0.189
		(0.188)
Ethnicity	White	(ref)
		-
	Non-White	0.061
		(0.058)
IMD quintile	1 (Poorest)	(ref)
		-
	2	0.044
		(0.064)
	3	-0.049
		(0.064)
	4	0.015
		(0.067)
	5 (Richest)	-0.004
		(0.066)
Government Office Region	North East	(ref)
		-
	North West	-0.151
		(0.099)
	Yorkshire & the Humber	-0.084
		(0.116)
	East Midlands	-0.060
		(0.105)
	West Midlands	-0.002
		(0.100)
	East of England	-0.070
		(0.104)
	London	-0.076
		(0.104)
	South East	-0.109
		(0.099)
	South West	0.046
		(0.111)
Alcohol Dependence	Alcohol Dependent	(ref)
		-
	Not Alcohol Dependent	-0.089
		(0.239)
N		1,815

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Constant suppressed from table. Data Source: APMS 2014.

Table 3.5: Estimating the Relative Probability of Living with Children for a Person Treated for Alcohol Dependence versus the General Population by Age and Gender

Sex	Age Band	% Living with Children (Census)	% Living with Children (NDTMS)	Estimated Relative Probability of Living with Children
Male	18-24	29.88	10.9	0.36
Male	25-34	29.45	24.4	0.83
Male	35-54	47.98	24.7	0.51
Male	55+	5.45	9.9	1.82
Female	18-24	35.93	23.9	0.67
Female	25-34	49.28	45.8	0.93
Female	35-54	55.02	41.8	0.76
Female	55+	2.32	10.4	4.50

Data Source: 2011 Census Sanpshot, NDTMS 2014/15.

3.3.2 The Number of Adults with Alcohol Dependence with Children

We estimate the number of adults with alcohol dependence that have children in the household to be 120,419 in England. Table 3.6 shows how the population for England breaks down by age and sex.

Table 3.6: Number of Adults with Alcohol Dependence with Children by Age and Sex

Age-Sex	Number of Adults with Alcohol Dependence	With Children in the Household
18-24 Male	59,382	5,280
25-34 Male	123,403	24,171
35-54 Male	221,404	47,168
55+ Male	52,024	3,905
18-24 Female	33,176	6,548
25-34 Female	30,315	11,768
35-54 Female	54,170	19,914
55+ Female	21,256	1,666
Total	595,131	120,419

Note: Numbers may not sum due to rounding.

The 95% confidence intervals are calculated using Monte-Carlo simulation as before. We do not provide confidence intervals around the probability of having children in the household because the census sample is large enough to estimate robustly. The confidence interval for the national estimate is 64,821 to 241,816.

3.3.3 The Number of Children living with Adults with Alcohol Dependence

Without adjutsing for double counting, we estimate the number of children living with an adult with alcohol dependence to be 222,007. However, there will be some children who are 'double-counted' by both adults with alcohol dependence in the household.

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The Health Survey for England 2014 suggests that the probability of having another dependent drinker in the household, given that the respondent is a male dependent drinker, is 9.62%.

We therefore adjust for double-counting by adjusting the number of adult males with alcohol dependence, decreasing it by 9.62%. The new estimate, after adjusting for double-counting, is 207,617. Because we adjust by rescaling the number of adult *males*, we do not provide a breakdown by age and sex. The Monte-Carlo confidence interval for the national estimate is 111,944 to 416,800.

Altneratively, we could adjust the double-counting by removing some female dependent drinkers. This gives a national estimate of the number of children living in a household with at least one adult with alcohol dependence of 189,119.

It should be remembered that we estimate there to be over 14,000 children living with *two* adults with alcohol dependence, and whilst this reduces the overall number of children living with adults with alcohol dependence because of double-counting, these children are likely to be at higher risk of problems associated with living with an adult with alcohol dependence. This increases to 32,888 children if we adjust for double-counting by removing some of the female dependent drinkers.

3.4   Conclusions

This chapter has estimated both the number of adults with alcohol dependence living with children, and the number of children living with adults with alcohol dependence.

We estimate there to be 120,419 adults with alcohol dependence living with children. This is approximately 20% of all adults with alcohol dependence. The confidence interval for the national estimate ranges from 64,821 to 241,816.

We estimate there to be between 189,119 and 207,617 children living with at least one adult with alcohol dependence in the household. We also estimate there to be between 14,390 and 32,888 children living with two adults with alcohol dependence.

Chapter 4

Estimates of the Proportion and Number of Adults with

Alcohol Dependence Amenable to Treatment

4.1   Introduction

The final chapter in this report estimtes the proportion, and number, of adults with alcohol dependence amenable to treatment. This is done using the Alcohol Toolkit Study, and estimates that 57.3% of adults with alcohol dependence wish to reduce their drinking, and that 41.2% intend to reduce their drinking. Older females are especially more likely to both desire and intend to reduce their drinking. There is also some local variation in the estimates.

4.2   Data and Methods

Our approach to estimating the number and proportion of people with alcohol dependence who may be amenable to treatment builds directly on the methods used by Buykx et al in Chapter 7 of the STreAM report.[17]

We used an existing dataset, the Alcohol Toolkit Study[23], a monthly, cross-sectional household survey of adults aged 16+. The survey commenced in March 2014, with ap-

proximately 1,600 respondents per month. Sample weights are supplied with the data to ensure national representativeness in terms of gender, working status, prevalence of children in the household, age, social grade and region. At the time of this analysis, data were available up to July 2016 (ie. 29 waves). In total, 12,195 cases were included in our analysis where the respondent:

- Was aged 18+ years

- Scored >4 on AUDIT-C (first 3 items on full AUDIT) or >7 on full AUDIT

- Answered item assessing 'motivation to reduce' alcohol use

The item mentioned in the final bullet point asks respondents "Which of the following best describes you?", with possible answers

1. I REALLY want to cut down on drinking alcohol and intend to in the next month

2. I REALLY want to cut down on drinking alcohol and intend to in the next 3 months

3. I want to cut down on drinking alcohol and hope to soon

4. I REALLY want to cut down on drinking alcohol but I don't know when I will

5. I want to cut down on drinking alcohol but haven't thought about when

6. I think I should cut down on drinking alcohol but don't really want to

7. I don't want to cut down on drinking alcohol

AUDIT score was used to derive three alcohol use groups: <16, 16-19, 20+, with categorisation in the latter group regarded as an indicator for alcohol dependence. Responses to the motivation to reduce alcohol use item were used as an indicator of potential amenability to alcohol treatment. Two indicators were derived: the broader indicator 'desire to reduce drinking' included response options 1-5 above, while the narrower indicator 'intention to reduce drinking' included options 1-3.

Summary statistics are presented in Table 4.1.

Logistic regression was used to examine the relationship between the two binary motivation to reduce drinking variables (desire and intention to reduce drinking) and six key predictor variables. In addition to the three predictor variables used in Buykx et al (i.e. 8 gender x age group [Male, Female; 18-24, 25-34, 35-54, 55+] combinations, AUDIT group [<16, 16-19 and 20+]), the current analysis also included ethnicity, (White, non-White), Government Office Region (9 regions), and presence of Children in the Household (Yes/No). These additional variables were included to more closely mirror the predictors used in Chapters 2 and 3 of this report.

Table 4.1: Summary Statistics

Variable		N	%
Total Respondents		**12,195**	
Age-Sex	18-24 Male	1,478	12.12
	18-24 Female	984	8.07
	25-34 Male	1,056	8.66
	25-34 Female	728	5.97
	35-54 Male	2,480	20.34
	35-54 Female	1,524	12.50
	55+ Male	2,903	23.80
	55+ Female	1,042	8.54
Ethnicity	White	11,684	95.81
	Non-White	511	4.19
Government Office Region	North East	1,049	8.60
	North West	2,410	19.76
	Yorkshire & the Humber	2,061	16.90
	East Midlands	777	6.37
	West Midlands	974	7.99
	East of England	920	7.54
	London	1,289	10.57
	South East	1,697	13.92
	South West	1,018	8.35
Audit Group	$< 16^*$	11,503	94.33
	16-19	398	3.26
	20+	294	2.41
Children in Household	No	5,654	46
	Yes	6,541	54

* Only those with an AUDIT score greater than 7 were kept for the analysis.

4.3 Results

Regression results for amenability are presented in Table 4.2 and Table 4.3. These are then used to estimate the proportion of adults with alcohol dependence who are amenable to treatment, shown in Table 4.4.

In comparison to the reference group (Males aged 18-24), Females aged 35-54 and 55+ were significantly more likely to express both the desire and the intention to reduce drinking, and Males aged 35-54 were also more likely to intend to reduce drinking. AUDIT group was significantly associated with desire and intention to reduce drinking, with those in the AUDIT 16-19 group at least three times as likely as those in the lowest drinking group (AUDIT <16) to indicate these motivations, and those in the AUDIT 20+ group at least six times as likely. Non-Whites were at least 1.8 times as likely to indicate both desire and intention to reduce drinking as Whites. Compared to respondents from the North East of England, those from the West Midlands were significantly less likely to desire or intend to reduce drinking, those from London were more likely to desire and those from Yorkshire and the Humber were less likely to intend to reduce drinking. The presence of Children in the Household was not associated with desire or intention to reduce drinking.

Table 4.2: Results of Logistic Regression to Estimate the Probability of an Individual to Express a Desire to Reduce Drinking

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	1.069
		(0.124)
	25-34 Male	0.972
		(0.113)
	25-34 Female	1.019
		(0.134)
	35-54 Male	1.112
		(0.105)
	35-54 Female	1.658
		(0.165)***
	55+ Male	0.867
		(0.088)
	55+ Female	1.343
		(0.159)**
Ethnicity	White	(ref)
		-
	Non-White	1.871
		(0.207)***
Government Office Region	North East	(ref)
		-
	North West	1.141
		(0.120)
	Yorkshire & the Humber	0.855
		(0.094)
	East Midlands	1.034
		(0.140)
	West Midlands	0.798
		(0.106)*
	East of England	1.118
		(0.142)
	London	1.319
		(0.152)**
	South East	1.032
		(0.116)
	South West	0.898
		(0.115)
Audit Group	<16	(ref)
		-
	16-19	3.720
		(0.409)***
	20+	6.564
		(0.799)***
Children in Household	No	(ref)
		-
	Yes	1.010
		(0.060)
N		12,195

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Odds Ratios

Table 4.3: Results of Logistic Regression to Estimate the Probability of an Individual to Express an Intention to Reduce Drinking

Age-Sex	18-24 Male	(ref)
		-
	18-24 Female	1.062
		(0.160)
	25-34 Male	1.161
		(0.170)
	25-34 Female	1.157
		(0.193)
	35-54 Male	1.372
		(0.164)***
	35-54 Female	2.046
		(0.256)***
	55+ Male	1.038
		(0.135)
	55+ Female	1.659
		(0.247)***
Ethnicity	White	(ref)
		-
	Non-White	1.882
		(0.249)***
Government Office Region	North East	(ref)
		-
	North West	0.999
		(0.124)
	Yorkshire & the Humber	0.741
		(0.098)**
	East Midlands	0.922
		(0.150)
	West Midlands	0.631
		(0.105)***
	East of England	0.935
		(0.143)
	London	1.166
		(0.159)
	South East	0.813
		(0.111)
	South West	0.736
		(0.116)*
Audit Group	<16	(ref)
		-
	16-19	3.275
		(0.424)***
	20+	6.037
		(0.789)***
Children in Household	No	(ref)
		(0.072)
	Yes	0.999
		(0.072)
N		12,195

* $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Odds Ratios.

Table 4.4: Estimated Number and Proportion of Adults with Alcohol Dependence who are Amenable to Treatment

Age-Sex	Number of Adults with Alcohol Dependence	% Desire to Reduce Drinking	Number Desire to Reduce Drinking	% Intend to Reduce Drinking	Number Intend to Reduce Drinking
18-24 Male	59382	55.4	32924	35.6	21125
18-24 Female	33176	57	18920	36.9	12250
25-34 Male	123404	54.8	67583	39	48077
25-34 Female	30315	55.9	16946	38.9	11787
35-54 Male	221404	58	128381	42.9	94921
35-54 Female	54170	67	36320	52.5	28437
55+ Male	52024	52	27045	36.4	18936
55+ Female	21256	62.4	13257	47.4	10081
Total	**595,131**	**57.4**	**341,376**	**41.3**	**245,614**

4.4   Conclusions

This chapter has estimated the probability of a drinker with an AUDIT score greater than 7 having (a) a desire to reduce their drinking, or (b) an intention to reduce their drinking.

We estimate that 57.4% of adults with alcohol dependence have a desire to reduce their drinking, and that this is typically higher in females.

We estimate that 41.3% of adults with alcohol dependence have an intention to reduce their drinking, and that this is also typically higher in females.

We find no statistically significant relationship between having children in the household and having either a desire or intention to reduce drinking.

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Appendix

Point estimates for each Upper Tier Local Authority are presented in Table 4.5.

Other results are presented in the supplementary Microsoft Excel appendix.

Table 4.5: Point Estimates by Upper Tier Local Authority

Upper Tier Local Authority	UTLA Code	Dependent Population	Dependent Population with Children	Children with Dependent	Children with Dependent (Double-Counting Adjusted)
Barking and Dagenham	E09000002	2125			
Barnet	E09000003	3114			
Barnsley	E08000016	3555			
Bath and North East Somerset	E06000022	1719		Publication of these	
Bedford	E06000055	1443		results is forthcoming	
Bexley	E09000004	2027		from PHE	
Birmingham	E08000025	13603			
Blackburn with Darwen	E06000008	2628			
Blackpool	E06000009	4305			
Bolton	E08000001	3768			
Bournemouth	E06000028	2988			
Bracknell Forest	E06000036	809			
Bradford	E08000032	6275			
Brent	E09000005	3181			
Brighton and Hove	E06000043	4455			
Bristol, City of	E06000023	6572			
Bromley	E09000006	2528			
Buckinghamshire	E10000002	3488			
Bury	E08000002	2147			
Calderdale	E08000033	2253			
Cambridgeshire	E10000003	5578			
Camden	E09000007	3277			
Central Bedfordshire	E06000056	1966			
Cheshire East	E06000049	3427			
Cheshire West and Chester	E06000050	3479			
City of London	E09000001	90			
Cornwall & Isles of Scilly	E0999	6589			
County Durham	E06000047	7136			
Coventry	E08000026	4770			
Croydon	E09000008	3068			
Cumbria	E10000006	5834			
Darlington	E06000005	1399			
Derby	E06000015	3222			
Derbyshire	E10000007	8534			
Devon	E10000008	7095			
Doncaster	E08000017	3938			
Dorset	E10000009	3492			
Dudley	E08000027	3863			
Ealing	E09000009	3499			
East Riding of Yorkshire	E06000011	2888			
East Sussex	E10000011	5297			
Enfield	E09000010	2845			
Essex	E10000012	12205			
Gateshead	E08000037	3007			
Gloucestershire	E10000013	5194			
Greenwich	E09000011	2914			
Hackney	E09000012	3716			
Halton	E06000006	1889			
Hammersmith and Fulham	E09000013	2583			
Hampshire	E10000014	9980			
Haringey	E09000014	3195			
Harrow	E09000015	1607			
Hartlepool	E06000001	1226			
Havering	E09000016	2189			
Herefordshire, County of	E06000019	1695			
Hertfordshire	E10000015	8661			
Hillingdon	E09000017	2790			
Hounslow	E09000018	2579			
Isle of Wight	E06000046	1513			
Islington	E09000019	3674			
Kensington and Chelsea	E09000020	1738			
Kent	E10000016	14052			
Kingston upon Hull, City of	E06000010	4814			
Kingston upon Thames	E09000021	1320			
Kirklees	E08000034	4588			
Knowsley	E08000011	2810			
Lambeth	E09000022	4701			
Lancashire	E10000017	14199			
Leeds	E08000035	10534			
Leicester	E06000016	3914			
Leicestershire	E10000018	5180			
Lewisham	E09000023	3481			
Lincolnshire	E10000019	6807			
Liverpool	E08000012	11458			
Luton	E06000032	2278			
Manchester	E08000003	9528			
Medway	E06000035	2808			
Merton	E09000024	1837			

(continued on next page)

Upper Tier Local Authority	UTLA Code	Dependent Population	Dependent Population with Children	Children with Dependent	Children with Dependent (Double-Counting Adjusted)
Middlesbrough	E06000002	2757			
Milton Keynes	E06000042	2021			
Newcastle upon Tyne	E08000021	4066			
Newham	E09000025	3615		Publication of these	
Norfolk	E10000020	9195		results is forthcoming	
North East Lincolnshire	E06000012	1957		from PHE	
North Lincolnshire	E06000013	1741			
North Somerset	E06000024	1817			
North Tyneside	E08000022	2604			
North Yorkshire	E10000023	5340			
Northamptonshire	E10000021	6535			
Northumberland	E06000057	3236			
Nottingham	E06000018	5515			
Nottinghamshire	E10000024	8346			
Oldham	E08000004	3039			
Oxfordshire	E10000025	5373			
Peterborough	E06000031	2456			
Plymouth	E06000026	3320			
Poole	E06000029	1564			
Portsmouth	E06000044	3075			
Reading	E06000038	1702			
Redbridge	E09000026	2197			
Redcar and Cleveland	E06000003	1855			
Richmond upon Thames	E09000027	1417			
Rochdale	E08000005	3260			
Rotherham	E08000018	3343			
Rutland	E06000017	243			
Salford	E08000006	4684			
Sandwell	E08000028	4673			
Sefton	E08000014	4290			
Sheffield	E08000019	6925			
Shropshire	E06000051	2883			
Slough	E06000039	1513			
Solihull	E08000029	1796			
Somerset	E10000027	5058			
South Gloucestershire	E06000025	2118			
South Tyneside	E08000023	1960			
Southampton	E06000045	3459			
Southend-on-Sea	E06000033	2091			
Southwark	E09000028	4088			
St. Helens	E08000013	2907			
Staffordshire	E10000028	8451			
Stockport	E08000007	3352			
Stockton-on-Tees	E06000004	2142			
Stoke-on-Trent	E06000021	3864			
Suffolk	E10000029	6571			
Sunderland	E08000024	4633			
Surrey	E10000030	7773			
Sutton	E09000029	1986			
Swindon	E06000030	1951			
Tameside	E08000008	3723			
Telford and Wrekin	E06000020	1949			
Thurrock	E06000034	1466			
Torbay	E06000027	1666			
Tower Hamlets	E09000030	3427			
Trafford	E08000009	2330			
Wakefield	E08000036	4500			
Walsall	E08000030	3364			
Waltham Forest	E09000031	2948			
Wandsworth	E09000032	3743			
Warrington	E06000007	2380			
Warwickshire	E10000031	4937			
West Berkshire	E06000037	1074			
West Sussex	E10000032	6967			
Westminster	E09000033	2728			
Wigan	E08000010	4484			
Wiltshire	E06000054	3777			
Windsor and Maidenhead	E06000040	982			
Wirral	E08000015	4891			
Wokingham	E06000041	777			
Wolverhampton	E08000031	3591			
Worcestershire	E10000034	5407			
York	E06000014	2331			