
Appendix A

Logistic regression

Methodology

- 4.1. Logistic regression has been used to assess which key factors (independent variables) are statistically related to households/landlords having carried out energy efficiency improvements in the last 12 months (the dependent variable).
- 4.2. Logistic regression has been used to assess which key factors (independent variables) are statistically related to the ownership of at least one working smoking alarm (the dependent variable).
- 4.3. As all of the independent variables considered are categorical variables, the regression analysis provides an insight into which categories or groups of households within these key factors are more or less likely to have a working smoke alarm/s. When using categorical variables in regression analysis one of the groups needs to be specified as the baseline group. The odds ratio, EXP (β) of the baseline group, is set as 1 (labelled as 'Reference category in Table 1). The odds ratios of the other groups are then calculated relative to the baseline group. Where the odds ratio is greater than 1, this group is more likely to have a working smoke alarm compared with the baseline group. Alternatively, where the odds ratio is less than 1 this group is less likely to have a working smoke alarm compared with the baseline group, Table A1.
- 4.4. The independent variables below are presented in order of their 'predictiveness' (based on the R squared value of the model) with the most important factors in explaining a household's ownership of at least one working smoke alarm listed first. This mirrors the order of the textual information provided in this chapter.
- 4.5. The logistic regression used standardised weighted data, (by weighting the weights by the overall mean weight) so that any relationships found would not be biased to the over-sampled groups or the very large weighted data sample size.
- 4.6. Although logistic regression can be used to explore associations between variables, it does not necessarily imply causation and results should be treated as indicative rather than conclusive.

Table A1: Logistic regression model for ownership of a working smoke alarm, 2012-13

all households

Independent variables	Odds ratios	Significance
household composition		
<i>couple with dependent child(ren)</i>	<i>Reference category</i>	
couple, no dependent child(ren) under 60	0.735	0.00 *
couple, no dependent child(ren) aged 60 or over	0.695	0.00 *
lone parent with dependent child(ren)	0.622	0.00 *
other multi-person household	0.552	0.00 *
one person under 60	0.417	0.00 *
one person aged 60 or over	0.626	0.00 *
income band		
<i>highest 20%</i>	<i>Reference category</i>	
lowest 20%	0.550	0.00 *
quintile 2	0.570	0.00 *
quintile 3	0.600	0.00 *
quintile 4	0.748	0.00 *
tenure		
<i>housing association</i>	<i>Reference category</i>	
owner occupiers	0.574	.000 *
private renters	0.428	.000 *
local authority	0.655	.006 *
accommodation type¹		
<i>detached house or bungalow</i>	<i>Reference category</i>	
semi-detached	0.753	0.00 *
terrace/end of terrace	0.627	0.00 *
purpose built flat/maisonette	0.602	0.00 *
flat conversion/rooms	0.548	0.00 *
ethnicity		
<i>white</i>	<i>Reference category</i>	
black	0.673	0.01 *
Indian	0.643	0.01 *
Pakistani or Bangladeshi	0.472	0.00 *
other Asian	0.935	0.82
Chinese	1.293	0.61
mixed	0.873	0.62
other	0.800	0.38
all BME households	0.668	0.00 *

continued

all households

Independent variables	Odds ratios	Significance
employment status of hrp		
<i>full-time work</i>	<i>Reference category</i>	
part-time work	0.821	0.04 *
retired	1.006	0.93
unemployed	0.644	0.00 *
full-time education	0.654	0.06
other inactive	0.749	0.00 *
age of HRP		
<i>35-44</i>	<i>Reference category</i>	
16-24	0.710	0.02 *
25-34	0.853	0.10
45-54	0.936	0.47
55-64	0.819	0.03 *
65 or over	0.908	0.25

sample size

13,652

Base: all households

Note: 'other' types of accommodation were excluded from the analysis e.g. boats or caravans, therefore note the 'sample size' column will not add up to the number of 'all households'.

Significance: * the result is significant at (or below) the .05 level

Source: English Housing Survey, full household sample