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Trends in Panel Attrition in Understanding Society: Waves 1 to 13

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Non-Technical Summary

Panel attrition occurs when panel members drop out of the panel while still eligible to be interviewed. Attrition poses a threat to data quality in longitudinal studies. First, the reduction in sample size might make the analysis of some sample subgroups difficult. Second, the propensity to drop out of the study varies across sample subgroups, and the differential attrition might result in biased survey estimates.

The analysis reported in this paper aims to describe the evolution of panel attrition in *Understanding Society*, devoting special attention to the impact of attrition on the sample profile of the General Population Sample (GPS), a sample representative of the Great Britain population, the Ethnic Minority Boost (EMB), which covers people from certain ethnic minorities, and the Immigration and Ethnic Minority Boost (IEMB), which in addition to the ethnic minorities oversamples immigrants living in households in Great Britain. Wave response rates are presented and compared between sample subgroups defined by the baseline characteristics of panel members. Furthermore, we investigate the effectiveness of survey weights in tackling the impact of attrition in the estimation samples that cover waves 1 to 13 of *Understanding Society*.

The results show that the GPS had lost 64.5% of the initial wave respondents by wave 13. This attrition rate is greater among young people, panel members with an ethnic minority background, and those on lower income or with no qualifications. However, the survey weights were able to mitigate the impact of attrition. The results also show a more pronounced attrition rate for the EMB and IEMB samples – the attrition rate is 78.7% for the EMB (after 12 waves) and 74.2% for the IEMB (after 7 waves).

Trends in Panel Attrition in *Understanding Society*: Waves 1 to 13

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Abstract: This report presents an analysis of panel attrition in *Understanding Society*. The analysis delves into the impact of dropouts on the sample profile of the General Population Sample (GPS), the Ethnic Minority Boost (EMB) and the Immigration and Ethnic Minority Boost (IEMB). In addition, we provide some indicators of the performance of the longitudinal survey weights in tackling attrition. This analysis covers up to wave 13 of *Understanding Society* (2021-23).

Keywords: panel attrition, sample composition, non-response bias.

JEL classification: C81, C83.

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Executive Summary

1. The impact of panel attrition on sample sizes in *Understanding Society* is cumulating. After 13 waves, the General Population Sample (GPS) of *Understanding Society* has a wave response rate of 35.5%. This response rate is almost 10 percentage points (p.p.) above the wave response rate of the British Household Panel Survey (BHPS) original sample (25.8%). However, BHPS attrition accumulated over 29 waves (1991 to 2021), so the GPS (2008/09 to 2021/22) is experiencing a more rapid erosion than the BHPS original sample, which was selected in 1991 and exhibited a wave response rate of 66.4% after 13 waves (1991 to 2003).
2. Panel attrition disproportionately affects ethnic minorities and immigrants. At wave 13, the Ethnic Minority Boost (EMB) sample, recruited in 2009, had a response rate of 21.3%, while the Immigration and Ethnic Minority Boost (IEMB) sample, recruited in 2014, had a response rate of 25.8% (after eight waves).
3. Certain demographic subgroups consistently exhibit higher rates of panel attrition. These include males, individuals aged 16-29 or 70 and older, those with an ethnic minority background, residents of London or Wales, individuals with lower personal income, those in poorer health, full-time students or unemployed individuals, those who had never married (prior to the recruitment wave), panel members with no qualifications, renters, lone parents, and individuals in larger households with children. These patterns hold true across the GPS, EMB, and IEMB samples.
4. The longitudinal weights are effective in tackling attrition and restoring the sample profile. The analysis used two estimation samples, one covering waves 1 to 13, which includes the GPS and EMB samples, and another covering waves 6 to 13, which also includes the various BHPS samples and the IEMB. The weights largely mitigated the deviations observed in the sample profile after 13 and 8 waves, respectively. However, some subgroups, such as persons with lower incomes, are slightly underrepresented even after applying the longitudinal weight.

1. Introduction

Panel attrition, which occurs when sample members who started participating in a longitudinal study drop out, poses a threat to data quality since it might bias survey estimates and impose limits on the ability of researchers to conduct longitudinal analyses. On the one hand, the drop-outs can bias survey estimates if the panel members who no longer participate differ from those who remain in the study with respect to the variable(s) involved in the estimation. On the other hand, to conduct longitudinal analyses, researchers require that panel members respond in all waves in which they are eligible to participate. A higher attrition rate would reduce the base for the longitudinal analyses, especially for the study of subpopulations or covering longer periods.

This report examines the impact of panel attrition on *Understanding Society* up to wave 13 (2021-23) and evaluates the ability of the longitudinal weights to mitigate its impact on a selection of survey estimates. The study has three main objectives: First, to assess the overall impact of panel attrition on the samples that form *Understanding Society*; second, to analyse the effect of panel attrition on the sample profile of the General Population Sample (GPS), the Ethnic Minority Boost sample (EMB), and the Immigration and Ethnic Minority Boost (IEMB); and finally, to evaluate the performance of survey weights in correcting the deviation of the sample profile caused by panel attrition.

This report constitutes a new addition to the research on the representativeness of *Understanding Society* conducted in recent years. Lynn and Borkowska (2018) explored the representativeness of the sample responding to the initial wave of the British Household Panel Study (BHPS) original sample and the GPS using the population figures from the Census. They also analysed the impact of attrition on the two samples covering up to wave 7 (1997 for BHPS; 2015-17 for GPS). Cabrera-Álvarez et al. (2022) extended the analysis of attrition on the GPS up to wave 11 (2019-21) in order to evaluate the effect of the COVID-19 pandemic. Moreover, the paper included an analysis of attrition in the IEMB and an assessment of the performance of the longitudinal weights in the GPS. This report builds upon these papers and extends the scope of the research by including an analysis of attrition in all samples of *Understanding Society*, offering an in-depth analysis of attrition in the GPS, EMB and IEMB, and evaluating the effectiveness of wave 13 longitudinal weights to adjust the demographic profile of the sample.

In the following section, we present an overview of the design of the different samples that form *Understanding Society* and explain the analytical approach. Then, we present a synthesis of the results and offer the complete set of tables in the annexes.

2. Methods

The analyses presented here are intended to: 1) document and compare attrition rates between all samples in *Understanding Society*, 2) document and compare between samples the extent of *differential* attrition between sample subgroups defined by a range of demographic characteristics, and 3) assess the effectiveness of the wave 13 longitudinal weights to mitigate the effect of attrition on estimation covering waves 1 to 13 and 6 to 13. Before describing the analysis methodology, we provide an overview of the different samples that form *Understanding Society*.

Samples in Understanding Society

The United Kingdom Household Longitudinal Study (UKHLS): *Understanding Society* is formed by seven samples up to wave 13 (2021-23). These samples were selected from the whole or part of the United Kingdom population resident in households at different points in time (see Table 1). The primary sample of the study is the GPS, a large representative sample of people residing in households in Great Britain, selected at the initial wave of *Understanding Society* (2009-11). This sample consists of an equal-probability sample of persons in England, Scotland and Wales, plus an overrepresentation of residents in Northern Ireland. At wave 1, an Ethnic Minority Boost (EMB) sample was selected from households where at least one person considered themselves or parents or grandparents to belong to one of the main ethnic minority groups in the UK (i.e., Indian, Pakistani, Bangladeshi, Black Caribbean or Black African) (Berthoud et al., 2009). At wave 6 (2014-16), a new Immigrant and Ethnic Minority Boost (IEMB) sample was selected, including UK residents born outside of the UK as well as the same ethnic groups included in the EMB (Lynn et al., 2018).

In wave 2, the former British Household Panel Survey (BHPS) samples entered *Understanding Society*. These include the original BHPS sample, selected in 1991, which covered the Great Britain household population, expanding the scope of potential longitudinal analyses back to 1991. Moreover, two boost samples of Scottish and Welsh households were drawn in 1999, and in 2001, the Northern Ireland Panel Survey (NIPS) sample was selected using a simple random sample of addresses.

Table 1. Samples that form Understanding Society

Sample	Population covered	Year selected	Wave entered *Understanding Society*	Adults (16+) responding initial wave
BHPS: Original Sample	England, Scotland, Wales	1991	2 (2010-12)	10,264
BHPS: Scottish Boost	Scotland	1999	2 (2010-12)	2,446
BHPS: Welsh Boost	Wales	1999	2 (2010-12)	2,467
Northern Ireland Panel Sample (NIPS)	Northern Ireland	2001	2 (2010-12)	3,458
General Population Sample (GPS)	England, Scotland, Wales, Northern Ireland	2009	1 (2009-11)	43,673
Ethnic Minority Boost (EMB)	Ethnic minorities in England, Scotland, Wales	2009	1 (2009-11)	6,626
Immigrant and Ethnic Minority Boost (IEMB)	Ethnic minorities and those born outside UK: England, Scotland, Wales	2014	6 (2014-16)	4,301

The first analysis presented in this report about the trend in wave response rates by sample origin uses information from the seven samples. The second part, an analysis of the impact of panel attrition on the sample profile, focuses on the GPS, EMB and IEMB samples. Finally, in the third part, the longitudinal weights are evaluated on their ability to restore the initial wave sample profile for waves 1 to 13 – which are only covered by the GPS and EMB sample – and from waves 6 to 13, which includes all seven samples for estimation.

Attrition analysis

The attrition analysis compares the wave response rates over time for several subgroups, shedding some light on how panel attrition impacts sample size and profile. The following paragraphs discuss the methodological decisions underlying the analysis and how these should be considered when interpreting the results.

The attrition analysis requires a reference sample, the base for the analysis, which allows us to compare response rates over time. In this analysis, the reference sample is formed by adults (aged 16 or over) who completed an individual interview at the initial wave of the sample, which is different for each of the samples (see Table 1). Fixing the base for the analysis enables us to compare the magnitude of conditional response rates at each wave; however, it should be noted that it does not consider panel members who become adults in the following waves and hence become eligible to complete an individual interview.

Furthermore, the estimation of conditional response rates at each wave requires the specification of the numerator, which corresponds to the number of respondents to the survey in a given wave, and the denominator, which is the panel members eligible for an adult

interview in that wave. For this analysis, we define respondents as panel members completing the adult questionnaire and those for whom a proxy response is obtained from another household member.

Regarding the denominator, the base for the analysis, the adults responding to the initial wave (including proxies) constitute the reference sample. However, as time passes, the eligibility situation of the panel members might change if they move out of the country or die. Identifying panel members who became ineligible requires that another household member report that this person emigrated or died. Nonetheless, some panel members stopped responding to the survey, and there is not enough information to determine whether this was a genuine case of non-response or a result of a change in the eligibility status. This lack of information introduces the risk of underestimating response rates, especially for some population subgroups, such as older adults, which are more likely to be affected by shifts in their eligibility. To mitigate this issue, we have implemented a twofold approach to correct for undetected mortality. First, from wave 9 onwards, we excluded from the response rates calculations panel members identified as deceased in linked death registrations. Second, for the BHPS sample and the GPS, we used a mortality propensity correction that covers from the initial wave up to wave 8 of *Understanding Society*[1] and relies on a survival model that uses data from official mortality statistics, the Census, and data collected during fieldwork (Kaminska, 2021).

Finally, it should be noted that response rates are sample-based estimates and, consequently, are subject to sampling error. Thus, minor differences between the rates should not necessarily be interpreted as meaningful differences.

Longitudinal weights to adjust the sample profile

The analysis of the effectiveness of longitudinal weights was carried out for two longitudinal estimation samples: the estimation sample covering waves 1 to 13, which includes the GPS and EMB samples, and the estimation sample covering waves 6 to 13, which uses data from the seven samples that form *Understanding Society*.

The analysis compared the design-weighted and weighted sample profile of respondents – at each wave up to wave 13 – to the estimates produced using the initial wave respondents. To carry out this comparison, we computed three estimates for each subgroup defined by a set of five demographic variables (sex, age, ethnic background, general health status and personal

[1] For the BHPS the mortality propensity adjustment is available up to wave 9 of *Understanding Society*.

income): the initial wave cross-sectional estimate, the wave 13 design-weighted estimate, and the wave 13 estimates weighted by the longitudinal weight.

First, we computed the initial wave cross-sectional estimate for each variable using all the initial wave responding adults still (assumed to be) eligible for an adult interview at wave 13. To compute these estimates, we used the initial wave cross-sectional weight that corrects for the unequal selection probabilities and non-response. Second, we computed the wave 13 design-weighted estimates, omitting the non-response and attrition corrections. The base for these estimates was the sample of respondents to the initial wave who participated in all waves up to and including wave 13. For the wave 6 to 13 estimation sample, instead of using the design weight, we used the longitudinal inclusion weight that, for the samples not selected at that wave, also corrected for non-response. Third, the wave 13 weighted estimates used the wave 13 longitudinal weight that includes those responding to the adult interview as well as proxy respondents. In these estimates, where possible, we included an adjustment to correct for the effect of undetected mortality, as explained in the previous section. Thus, the first (initial wave) estimate provides a target distribution, the second (design-weighted) shows the unadjusted effect of attrition, and the third (fully weighted) shows the effect of the weighting in restoring the target distribution.

3. Results

In this section, we first present the evolution of attrition over time in *Understanding Society*. Then, we focus on how attrition has impacted the GPS, EMB and IEMB sample profiles. Finally, we assess the ability of the longitudinal weights to restore the sample profile.

Panel Attrition in Understanding Society

Figure 1 shows the trends in conditional wave response rates for the samples that form *Understanding Society*. At wave 13, the GPS is the sample with the highest wave response rate (35.5%), followed by the BHPS original sample (25.8%), the IEMB (25.8%), the BHPS Welsh Boost (25.2%), the NIPS (23.8%), the BHPS Scottish Boost (23.1%), and the Ethnic Minority Boost sample (21.3%).

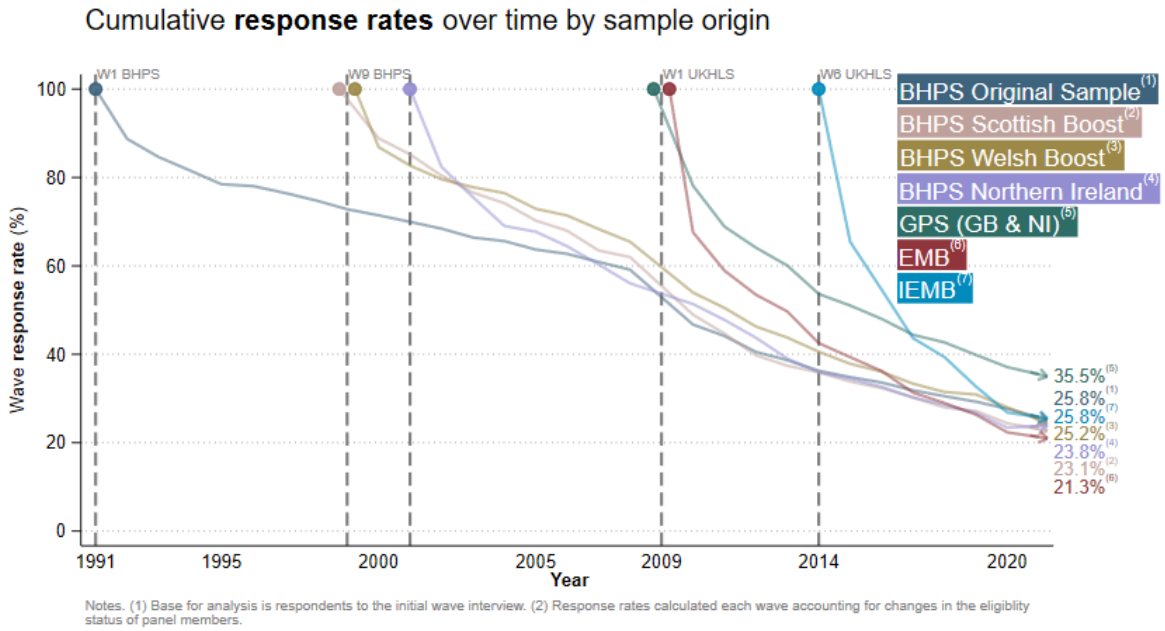

Figure 1. Cumulative response rates conditional on initial participation, by sample origin.

However, these samples covered different populations and were selected at various points in time, making it difficult to interpret the differences in the response rates. Considering the drop in response rates for the first three waves, the BHPS original sample, selected in 1991, has been the most resilient, with a decline of 15.4 p.p., whilst the GPS, recruited in 2009-11, exhibited a drop of 31.1 p.p. in the same time interval. This trend is not limited to the first three waves: panel attrition in the BHPS original sample was consistently lower than in the GPS eighteen years later. For instance, whilst the wave response rate at wave 13 is 35.5% for the GPS (2009/10 to 2021/22), the BHPS original sample exhibited a 66.4% response rate at BHPS wave 13 (1991 to 2003). The attrition rate was more pronounced for the EMB and IEMB

samples covering ethnic minorities and immigrants, with 41.1 p.p. and 45.4 p.p. erosion in the first three years. This trend has remained unaltered: these subgroups have continued to have a greater propensity to drop out from the survey.

Panel Attrition in the GPS, EMB and IEMB Samples

At wave 13, the response rate for females was slightly higher than for males (Figure 2). This trend is observed in each of the three samples examined – the GPS, the EMB and the IEMB, although the difference between males and females is more pronounced in the ethnic minority boost samples. Females had a wave response rate of 2.4 p.p. higher than males in the GPS, whilst this difference was 3.5 p.p. in the EMB and 5.2 p.p. in the IEMB.

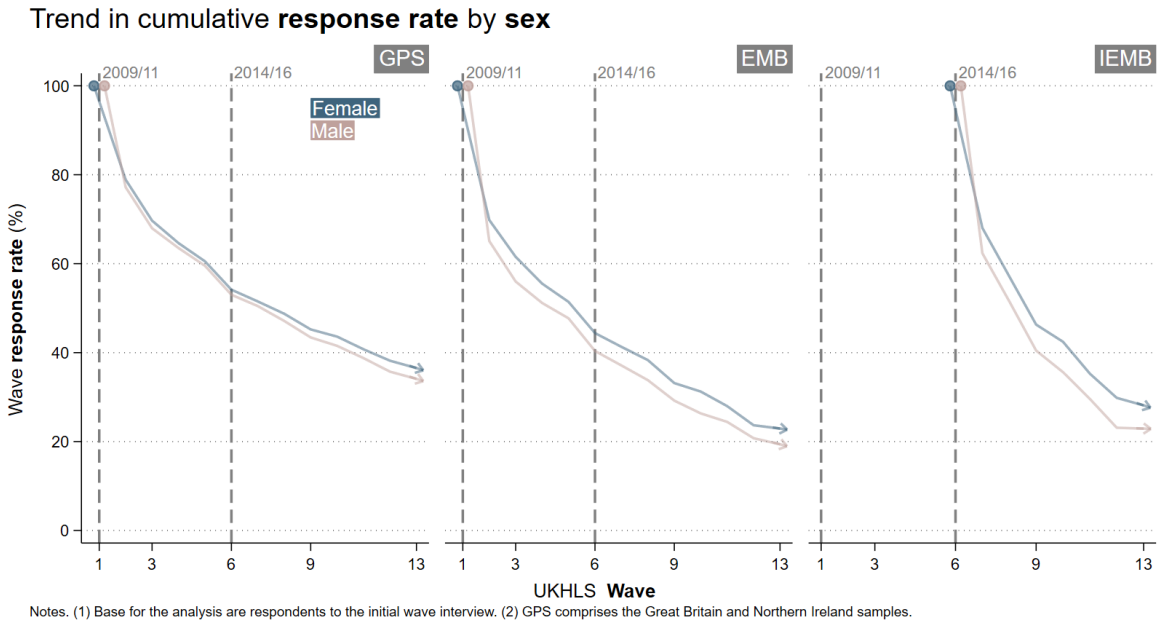

Figure 2. Panel attrition by sex and sample origin.

Regarding age, Figure 3 shows a correlation between age and the propensity to drop from the study, so younger panel members in the initial wave (16-29) have a lower response rate than older participants (50-69). This trend is consistent over time and across samples, except for the eldest participants (70 and older). This age group exhibits a high response rate in the waves following the recruitment, but their response propensities progressively erode so that after 13 waves (for the GPS and EMB), only the youngest group has a lower response rate. It is important to note that the eldest participants are more likely to be affected by undetected mortality, meaning that some panel members identified as non-respondents might well be non-eligible, resulting in an under-estimated response rate.

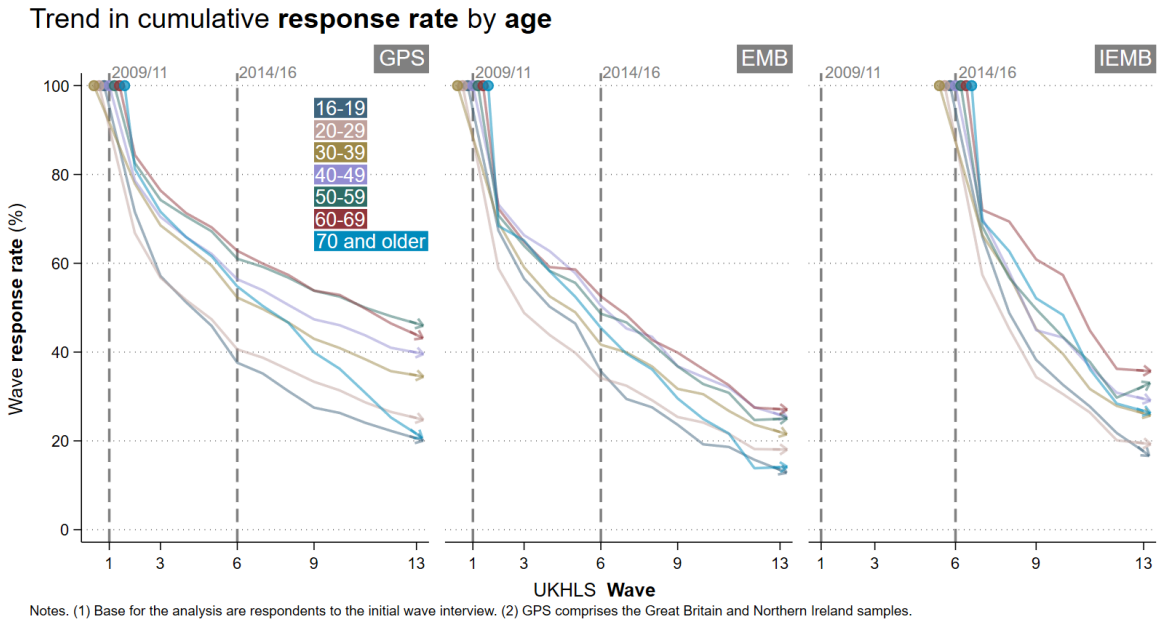

Figure 3. Panel attrition by age and sample origin.

In terms of ethnic background (Figure 4), in the GPS, white panel members had a higher response rate than those with an ethnic minority background. White panel members had a 36.9% response rate after 13 waves, twice the response rate of black panel members (17.1%) or those with a Bangladeshi background (18.5%). In the EMB and IEMB, Indian, Pakistani and panel members with mixed backgrounds had higher response rates than the black or Bangladeshi panel members.

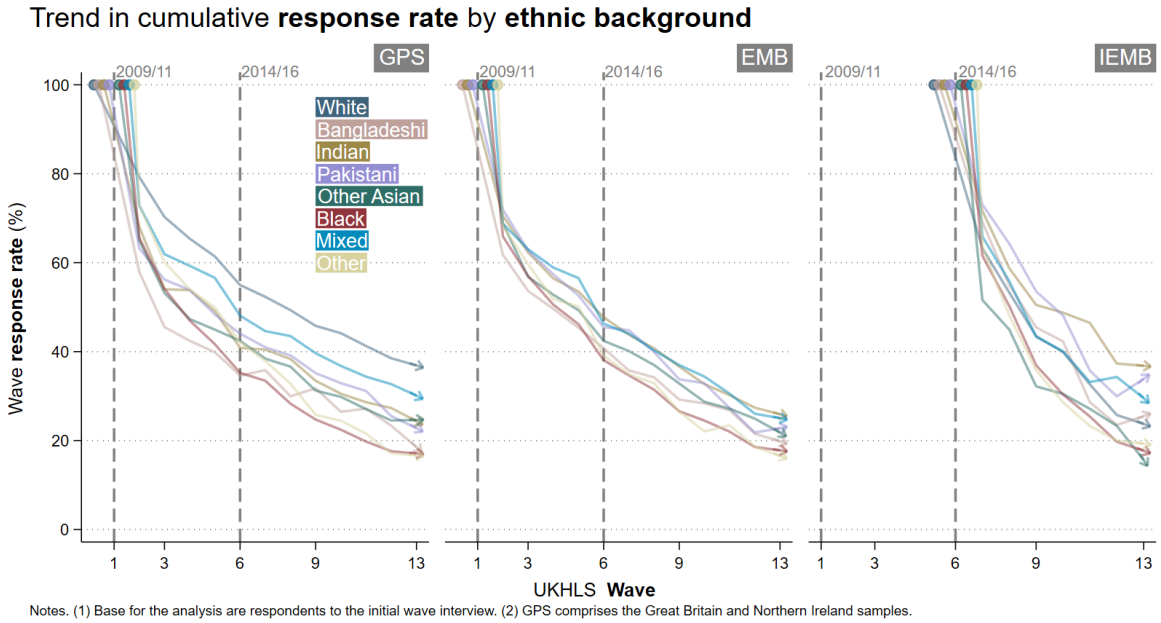

Figure 4. Panel attrition by ethnic background and sample origin.

Personal income level is correlated with response propensity over time (Figure 5). Panel members with higher incomes were more likely to continue participating in the survey after 13 waves compared to those with lower incomes. For instance, in the GPS, the response rate at wave 13 for individuals in the top income quintile was 46.2%, 18.6 p.p. higher than that for the panel members in the bottom income quintile (27.6%). We observe similar tendencies in the EMB and IEMB samples, although the difference between the response rates of the top and bottom income quintiles is less pronounced. For instance, in the EMB, the response rate of the panel members in the top income group was 26.6%, whilst the bottom income quintile had an 18.0% response rate, 8.6 p.p. lower.

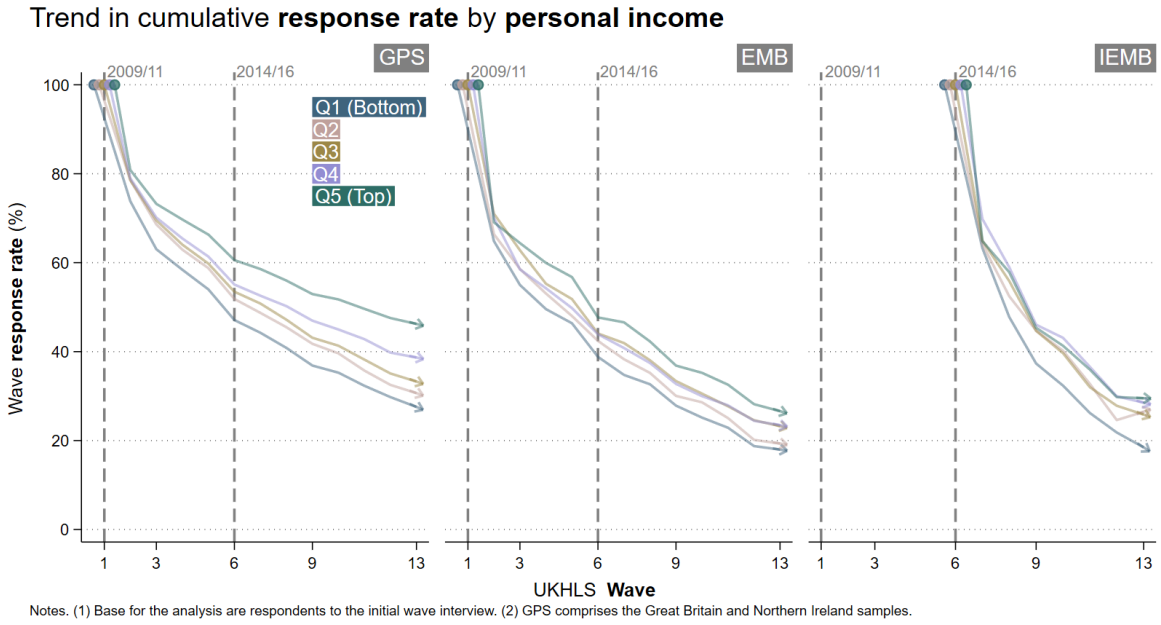

Figure 5. Panel attrition by income quintiles and sample origin.

In the GPS, people with better general health at the initial wave were more likely to continue to respond until wave 13 (Figure 6). The wave 13 response rate for panel members with excellent health status in 2009-12 was 37.1%, similar to that of those declaring very good health (37.5%). In contrast, the group that declared poor health in the initial wave had a 26.2% response rate. For the EMB and IEMB, this relationship does not exist. In both cases, panel members with either poor or excellent health status exhibit lower response rates than the rest. For example, in the IEMB, individuals with excellent health had a 22.9% response rate in wave 13, similar to those with poor health (24.1%), while the group with fair health had a 30.7% response rate, and those with very good health, 29.6%.

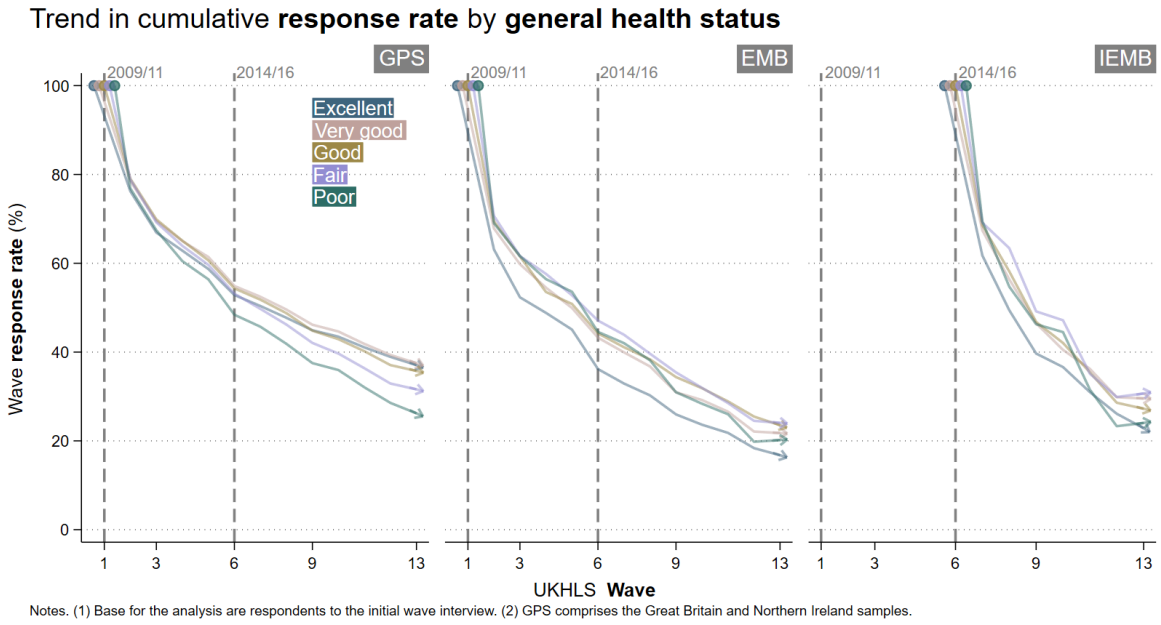

Figure 6. Panel attrition by subjective health status and sample origin.

Regarding the region of residence, panel members living in London when first interviewed were most likely to drop out over time. At wave 13, the response rate was 28.7% in the GPS (Table 5), 19.8% in the EMB (Table 14) and 20.2% in the IEMB (Table 23). In contrast, the South East and South West regions registered the lowest level of attrition. For instance, for the GPS, the response rate for the South East was 39.0% and 39.5% for the South West.

In terms of marital status, single panel members at the beginning of the study experienced the highest levels of attrition. In the GPS (Table 8), the response rate for single panel members was 27.8% at wave 13, considerably lower than that of those who were married when they entered the study (40.3%). A similar trend is observed in the EMB (Table 17) and IEMB (Table 26) samples. For example, after eight waves, the response rate for the IEMB panel members who were single when they joined was 21.2% versus 29.7% of those who were married.

Drop-outs are more likely among panel members with no qualifications when entering the study than those with a university degree. In the GPS (Table 9), the response rate for panel members with no qualifications was 23.7% compared to 45.4% for those with a university degree. Although this difference is also observed in the EMB (Table 18) and the IEMB (Table 27), it is less pronounced. In the EMB, panel members with a degree have a response rate 5.8 p.p. higher than those with no qualifications, whilst in the IEMB, this difference is 6.8 p.p. (compared to 21.7 p.p. in the GPS).

Panel members who were full-time students or unemployed at the initial wave had a lower response rate than those in paid employment. In the GPS (Table 7), full-time students had a response rate of 22.1%, similar to those unemployed (24.3%), whereas those in paid employment exhibited a higher response rate (40.4%). This tendency is also reflected in the results from the EMB (Table 16) and IEMB (Table 25). For example, in the EMB, the response rate for full-time students was 14.2%, 10 points lower than those in paid employment (24.5%).

Lone parents have a higher tendency to leave the panel than those from other types of households. This finding was consistent across samples. In the GPS (Table 10), the response rate of lone parents was 26.7%, 13.7 p.p. lower than the response rate of panel members living in couples. These differences were less pronounced in the EMB (Table 19), where the response rate of lone parents was 18.2% compared to the 23.5% response rates exhibited by couples with children. In the IEMB (Table 28), the response rate for lone parents after eight waves was 22.0%.

Panel members renting their homes were more likely to drop out of the study than those who own their houses. In the GPS (Table 11), homeowners with a mortgage (39.9%) or outright (40.4%) exhibit higher response rates than panel members renting privately(24.4%) or in social housing (23.5%). In the EMB (Table 20), the difference in response rates between private renters and homeowners (outright) is similar to the one observed in the GPS, 13 p.p., whilst this difference is even larger in the IEMB (Table 29), 25.7 p.p.

Performance of longitudinal weights

In this section, we examine the performance of the longitudinal weights to adjust the sample profile for non-response and panel attrition. Table 2 presents the results for the sample of adults responding to the initial wave and (assumed to be) eligible for an adult interview at wave 13. We differentiate between the estimation sample covering waves 1 to 13 (left pane), which uses data from the GPS and the EMB, and the one covering waves 6 to 13 (right pane), which combines all seven samples of *Understanding Society*. In each of the panes, we compare the initial wave sample distribution of those eligible for an adult interview at wave 13 (first column), the design-weighted distribution of wave 13 respondents (second column) and the weighted distribution using the wave 13 longitudinal weight (third column).

Overall, the longitudinal weight adjusts well the samples for non-response to the initial wave and attrition. For the estimation sample covering waves 1 to 13, the longitudinal weight restores the sex distribution for wave 13 respondents. While the initial wave sample had 48.1% males,

this percentage was 42.1% for the respondents to wave 13 (design-weighted). Once the longitudinal weight is applied, this percentage increases to 48.3%. Regarding the age distribution, the longitudinal weights can adjust the sample of wave 13 respondents to minimise the differences with the sample distribution in the initial wave. However, for the age group of 70 and older, the difference between the initial wave and the wave 13 weighted estimates is 3.5 p.p. This difference might be the result of the undetected mortality in the initial sample. The longitudinal weight is also successful in reducing the effect of non-response and attrition on the distributions of ethnicity, general health status, and income.

The longitudinal weight also helps restore the sample profile of wave 13 respondents in the estimation sample covering waves 6 to 13, which includes all seven UKHLS samples. Regarding sex, the longitudinal weight reduces the overrepresentation of females due to attrition. Likewise, in terms of age, the use of the weight mitigates the underrepresentation of younger panel members (16-29). This positive effect of the weights is also observed for ethnic background and the personal income variables. The percentage of panel members with an ethnic minority background slightly increases when using the weight, and the same is true for people on lower incomes. Yet, even after using the weight, ethnic minorities and people of lower income are slightly underrepresented.

Table 2. Sample profile for the initial wave respondents eligible for an adult interview at wave 13 and respondents to wave 13 and all the previous waves, unweighted and weighted estimates.

		Waves 1 to 13: GPS and EMB			Waves 6 to 13: GPS, EMB, BHPS and IEMB		
		UKHLS Wave 1 (2009-11) Weighted	UKHLS Wave 13 (2021-23)		UKHLS Wave 6 (2014-16) Weighted	UKHLS Wave 13 (2021-23)	
			Design weighted	Weighted		Design weighted	Weighted
Sex	**Male**	48.1	42.1	48.3	46.4	43.8	46.4
	Female	51.9	57.9	51.7	53.6	56.2	53.6
Age at initial wave	**16-19**	7.0	2.2	6.0	6.6	2.6	4.7
	20-29	18.2	9.6	18.3	13.6	8.6	12.2
	30-39	17.7	16.1	18.3	14.5	14.0	14.6
	40-49	20.0	22.0	21.7	18.2	18.8	18.9
	50-59	15.8	23.5	17.6	18.2	22.1	20.5
	60-69	12.8	20.8	13.0	15.8	21.7	17.8
	70+	8.6	5.8	5.1	13.2	12.2	11.2
Ethnic group	**White**	90.3	95.7	90.0	90.7	95.1	93.1
	Black	2.3	0.7	2.6	2.1	0.8	1.4
	Indian	2.4	1.2	2.5	2.0	1.3	1.8
	Pakistani	1.2	0.5	1.2	1.2	0.5	0.9
	Bangladeshi	0.5	0.1	0.6	0.5	0.2	0.4
	Other Asian	1.1	0.5	0.8	1.2	0.6	0.7
	Mixed	1.1	0.9	1.7	1.2	0.9	1.2
	Other	1.0	0.4	0.7	1.0	0.4	0.5
General health status	**Excellent**	19.8	20.3	19.9	18.8	17.8	18.1
	Very Good	34.0	35.8	35.3	36.2	37.9	37.4
	Good	27.9	28.4	28.7	27.2	28.0	27.7
	Fair	13.0	11.6	12.1	12.8	12.2	12.5
	Poor	5.3	3.9	4.1	4.9	4.0	4.4
Income	**Bottom**	20.7	14.4	18.9	18.3	13.6	16.0
	Second	18.1	16.7	17.0	19.3	18.0	18.6
	Third	19.2	18.7	19.2	20.2	20.4	20.8
	Fourth	20.5	22.5	21.6	20.4	22.5	21.5
	Top	21.5	27.8	23.3	21.7	25.6	23.2
Unweighted base		44,385	9,924	9,924	36,891	16,073	16,073

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Annex A: Attrition in the General Population Sample

Notes to Annex A tables: Cells entries for wave 1 indicate the number of respondents to the adult interview in wave 1 (personal or proxy). The rest of the cells contain the response rate for the subgroup as the percentage of wave 1 respondents who completed the interview in that wave. Ineligible cases were removed from the response rates calculations and, as explained in the methods sections, further adjustments were implemented to deal with under-identified mortality. However, it is likely that remains some undetected ineligibility that might cause the underestimation of the response rates. The undetected ineligibility is likely to increase over time, especially in the oldest age groups.

Table 3. GPS Attrition: Sex, Age and Ethnic Group

		Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Full sample		43,673	78.1	68.9	64.1	60.1	53.7	51.0	48.0	44.4	42.7	39.9	37.1	35.5
Sex	**Male**	19,773	77.2	68.0	63.5	59.5	53.0	50.5	47.1	43.4	41.5	38.8	35.7	34.1
	Female	23,900	78.9	69.7	64.6	60.5	54.2	51.5	48.7	45.2	43.6	40.8	38.2	36.5
Age at wave 1	**16-19**	2,700	71.5	57.1	51.2	45.9	37.6	35.2	31.2	27.5	26.3	24.1	22.3	20.6
	20-29	6,389	66.8	56.8	51.7	47.4	40.6	38.7	36.1	33.3	31.4	28.7	26.5	25.2
	30-39	7,408	77.9	68.5	64.1	59.5	52.3	49.7	46.7	43.0	40.9	38.4	35.7	34.8
	40-49	8,266	78.6	70.5	65.9	62.1	56.4	53.9	50.6	47.4	46.1	43.8	41.0	39.9
	50-59	6,891	82.6	74.3	70.6	67.2	61.0	59.2	56.7	53.8	52.5	50.0	48.1	46.4
	60-69	6,287	84.4	76.4	71.3	68.1	62.8	59.9	57.4	53.8	52.9	49.8	46.5	43.9
	70+	5,732	81.3	71.6	65.9	61.6	54.8	50.4	46.6	39.9	36.2	30.8	25.3	21.6
Ethnic group	**White**	39,636	79.3	70.3	65.4	61.4	55.0	52.3	49.3	45.8	44.2	41.3	38.5	36.9
	Black	938	65.6	54.1	47.0	41.7	35.2	33.5	28.3	24.7	22.5	19.8	17.6	17.1
	Indian	891	68.1	54.0	53.8	49.1	40.9	40.5	38.4	33.4	30.5	28.6	27.3	24.4
	Pakistani	551	63.2	56.2	53.9	48.3	44.0	41.0	39.2	35.2	32.9	31.2	25.5	22.8
	Bangladeshi	194	57.9	45.5	42.5	39.9	34.6	35.8	30.0	31.7	26.5	27.2	23.4	18.5
	Other Asian	467	65.0	53.2	47.3	45.0	42.4	38.4	36.6	31.2	29.8	27.1	24.5	24.7
	Mixed	464	72.9	61.9	59.3	56.6	48.1	44.6	43.5	39.7	36.8	34.4	32.7	30.1
	Other	486	72.9	60.1	54.0	49.9	42.1	37.9	32.8	25.8	24.5	21.6	17.1	16.7

Table 4. GPS Attrition: General Health Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Excellent	8,022	76.2	66.9	62.8	58.7	52.9	50.4	47.7	44.9	43.5	41.1	38.9	37.1
Very Good	14,015	78.5	69.5	65.0	61.4	54.9	52.5	49.6	46.2	44.6	41.8	39.4	37.5
Good	12,068	79.1	69.9	65.1	60.7	54.3	51.8	48.8	44.8	42.9	40.2	37.1	35.8
Fair	6,355	78.9	69.2	63.9	59.6	53.2	49.7	46.2	42.1	39.7	36.4	32.9	31.6
Poor	3,150	76.9	67.4	60.5	56.4	48.4	45.7	41.9	37.5	36.0	32.1	28.6	26.2

Note: General health status was not included in the proxy questionnaire, so analysis for this variable is restricted to sample members who completed the personal interview at wave 1.

Table 5. GPS Attrition: General Office Region (GOR)

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
North East	1,990	78.5	69.0	63.3	60.0	54.6	52.3	48.1	44.7	42.9	40.8	38.4	35.3
North West	4,975	78.7	69.3	64.1	59.8	52.2	49.2	46.6	43.6	42.0	38.4	34.6	33.7
Yorks & Humber	3,774	75.6	68.8	64.7	61.2	56.3	54.0	51.7	46.9	46.1	41.7	38.7	38.2
East Midlands	3,452	80.4	72.2	68.8	64.6	57.5	53.1	49.4	46.4	44.6	42.3	39.5	37.0
West Midlands	3,781	76.3	66.3	62.0	58.6	52.1	50.2	47.9	44.1	42.4	39.7	36.7	36.0
East of England	4,095	80.1	71.0	66.9	62.4	56.2	54.0	50.4	46.7	45.7	43.0	40.3	38.4
Greater London	4,112	70.1	59.9	54.9	51.8	46.2	44.0	40.9	37.2	34.8	33.6	30.3	28.7
South East	5,786	80.6	70.9	65.7	63.0	56.3	54.1	51.0	47.4	45.7	43.2	41.5	39.0
South West	3,802	82.1	73.8	70.6	66.3	59.9	56.0	53.3	49.2	47.0	44.3	41.2	39.5
Wales	2,299	78.9	71.0	66.0	56.9	49.7	45.0	41.4	37.9	35.6	32.7	30.9	28.8
Scotland	3,519	74.9	63.9	59.4	55.9	48.4	47.2	44.1	41.1	39.5	36.2	34.6	33.3
Norther Ireland	2,088	83.0	72.4	62.6	56.5	51.9	50.5	47.7	44.2	41.9	38.3	34.4	33.0

Table 6. GPS Attrition: Personal Income in Quintiles

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Bottom quintile	8,780	73.8	63.0	58.4	54.0	47.1	44.2	40.9	36.9	35.3	32.3	29.8	27.6
Second quintile	8,728	78.5	68.6	62.9	58.8	51.8	48.7	45.5	41.8	39.6	35.7	32.5	30.7
Third quintile	8,759	78.6	69.5	64.1	59.8	53.5	50.8	47.2	43.1	41.3	38.2	35.1	33.3
Fourth quintile	8,715	79.0	70.2	65.5	61.4	55.1	52.6	50.2	47.0	45.0	42.8	39.8	38.7
Top quintile	8,691	80.8	73.2	69.7	66.3	60.6	58.6	56.0	52.9	51.8	49.6	47.6	46.2

Note: Income quintiles were derived from the variable a_fimngrs_dv, gross personal monthly income as reported at wave 1.

Table 7. GPS Attrition: Employment Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Self employed	3,199	77.8	68.8	65.6	60.9	54.4	51.8	48.6	44.5	43.8	40.4	38.1	35.8
Paid employment	20,864	78.4	69.8	65.4	61.6	55.3	53.2	50.5	47.6	46.0	43.8	41.6	40.4
Unemployed	2,566	70.8	60.2	54.6	51.0	44.4	40.7	37.8	34.2	32.1	28.7	25.5	24.3
Retired	9,620	83.1	74.4	69.0	65.1	59.0	55.3	52.1	47.0	44.7	40.5	36.5	33.5
Family care or home	2,664	76.6	66.3	60.0	55.9	50.0	47.3	43.8	39.1	37.3	34.5	31.0	30.2
Full-time student	2,707	68.7	55.4	50.3	45.3	37.1	35.6	32.0	28.9	27.4	26.0	23.6	22.1
Long-term sick or disabled & others	2,043	76.9	67.5	62.8	57.8	51.2	48.0	44.7	41.1	39.0	34.8	31.4	28.5

Note: Employment status derived from a_jbstat as reported in wave 1.

Table 8. GPS Attrition: Marital Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Single	13,404	71.4	60.7	55.6	51.2	44.3	42.2	38.9	35.8	34.0	31.7	29.2	27.8
Married	22,255	81.3	72.6	68.1	64.3	58.2	55.3	52.6	49.0	47.4	44.6	42.0	40.3
Separated/Divorced	5,086	80.3	72.6	67.2	62.9	56.6	54.6	51.6	47.1	45.7	42.6	38.9	37.4
Widowed	2,914	81.4	72.3	67.7	64.4	57.2	53.3	49.9	45.5	42.2	37.4	33.5	30.9

Note: Marital status derived from a_marstat as reported in wave 1.

Table 9. GPS Attrition: Highest Qualification

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
No qualifications	7,695	76.7	65.5	59.1	54.7	47.8	44.1	40.8	36.4	33.9	29.4	25.6	23.7
Other	4,700	78.4	68.9	64.1	60.2	53.7	49.6	46.8	42.8	40.2	36.6	33.1	30.9
GCSE or equivalent	9,211	77.7	67.2	61.7	57.4	50.2	48.0	44.5	40.8	39.1	36.6	33.6	32.2
A-level or equivalent	8,243	76.6	67.1	62.2	58.0	51.0	48.8	45.5	42.6	40.7	38.2	36.0	34.3
Degree or equivalent	13,759	80.3	73.2	69.8	66.2	60.7	58.6	56.1	52.6	51.5	49.3	47.0	45.4

Note: Highest qualification derived from a_hiqual_dv as reported in wave 1.

Table 10. GPS Attrition: Household Type

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
An adult, no children	6,815	78.1	70.5	66.0	62.3	56.7	53.6	50.9	46.9	44.6	41.5	38.1	35.2
An adult, children	2,320	76.2	66.7	60.4	54.3	46.2	44.2	40.5	36.0	33.6	30.3	27.1	26.7
Couple, no children	13,093	81.6	72.6	68.0	64.1	58.1	55.9	53.3	49.4	48.0	45.2	42.1	40.4
Couple, children	10,376	79.5	70.6	65.7	61.7	54.5	51.4	48.1	44.5	43.1	39.9	37.5	36.4
Two or more adults, no children	7,024	72.8	61.9	57.6	54.0	48.0	45.3	42.6	39.7	37.9	36.0	33.5	32.0
Two or more adults, children	4,045	74.0	63.7	58.3	53.7	46.9	44.8	40.9	38.2	36.3	33.8	32.0	30.1

Note: Household type derived from a_hhtype_dv in wave 1.

Table 11. GPS Attrition: Household Tenure

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Owned outright	13,209	82.7	73.8	68.9	65.0	59.0	56.4	53.4	49.5	47.9	44.8	41.9	39.9
Owned with mortgage	16,895	79.9	71.4	67.8	63.8	57.4	54.8	52.0	48.7	47.1	45.1	42.7	40.9
Local authority housing	7,295	75.6	65.3	58.7	54.1	46.8	43.3	39.4	35.4	32.9	28.7	24.7	23.5
Rented private	5,669	66.1	55.5	49.2	45.1	39.1	37.8	35.1	31.7	30.2	27.5	25.6	24.4
Other	509	74.4	59.4	61.5	55.0	47.3	43.1	40.0	36.7	35.8	33.0	30.2	29.4

Note: Household tenure derived from a_tenure_dv in wave 1.

Annex B: Attrition in the Ethnic Minority Boost Sample

Notes to Annex B tables: Cells entries for wave 1 indicate the number of respondents to the adult interview in wave 1 (personal or proxy). The rest of the cells contain the response rate for the subgroup as the percentage of wave 1 respondents who completed the interview in that wave. Ineligible cases were removed from the response rates calculations and, as explained in the methods sections, further adjustments were implemented to deal with under-identified mortality. However, it is likely that remains some undetected ineligibility that might cause the underestimation of the response rates. The undetected ineligibility is likely to increase over time, especially in the oldest age groups.

Table 12. EMB Attrition: Sex, Age and Ethnic Group

		Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Full sample		6,626	67.6	58.9	53.5	49.7	42.5	39.4	36.2	31.3	29.0	26.3	22.3	21.3
Sex	**Male**	3,130	65.1	56.0	51.2	47.7	40.4	37.1	33.8	29.2	26.3	24.4	20.8	19.4
	Female	3,496	69.8	61.5	55.5	51.4	44.4	41.3	38.3	33.2	31.3	28.0	23.7	22.9
Age at wave 1	**16-19**	647	67.3	56.5	50.2	46.4	35.7	29.4	27.6	23.6	19.2	18.6	15.7	13.5
	20-29	1,603	58.8	48.8	43.8	39.8	34.1	32.4	29.2	25.4	24.1	21.6	18.2	18.1
	30-39	1,728	69.1	59.1	52.6	49.0	41.7	39.9	36.8	31.7	30.5	26.8	23.7	22.0
	40-49	1,278	73.2	66.3	62.7	57.8	50.4	45.3	43.4	36.8	34.4	32.0	27.6	25.8
	50-59	712	70.8	63.9	58.3	55.6	48.7	46.7	41.9	36.8	32.8	30.8	24.7	25.0
	60-69	363	72.3	64.8	59.1	58.6	52.6	48.3	42.7	39.9	36.2	32.6	27.5	27.1
	70+	295	68.4	65.1	58.2	52.5	45.5	39.6	36.1	29.6	24.9	21.7	13.9	14.1
Ethnic group	**White**	22	68.2	72.7	72.7	68.2	63.6	66.7	71.4	61.9	57.1	57.1	57.1	57.1
	Black	1,879	65.9	57.0	50.6	46.2	38.1	34.7	31.4	26.6	24.5	22.0	18.5	17.8
	Indian	1,183	70.5	62.3	56.5	53.5	47.7	43.8	40.7	36.6	32.7	30.2	27.4	25.9
	Pakistani	1,059	71.9	62.7	57.4	52.6	45.5	44.8	39.9	33.8	32.9	27.3	21.8	22.8
	Bangladeshi	1,081	61.8	53.7	49.6	45.4	40.8	35.8	34.2	29.2	28.4	26.8	21.6	19.8
	Other Asian	564	68.9	56.8	52.8	49.3	42.4	40.1	37.0	32.8	28.7	27.2	24.9	21.8
	Mixed	475	68.7	63.0	58.9	56.5	46.3	44.0	40.3	37.0	34.4	30.5	26.0	25.1
	Other	363	68.3	59.7	51.8	50.2	39.1	34.9	32.9	26.5	22.1	23.4	18.6	16.6

Table 13. EMB Attrition: General Health Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Excellent	1,410	63.1	52.3	48.8	45.1	36.2	32.9	30.3	26.0	23.7	21.8	18.4	16.8
Very Good	2,035	67.9	59.8	54.5	49.9	43.2	40.0	36.8	31.0	29.2	26.6	22.1	21.8
Good	1,792	69.5	61.5	53.5	50.8	44.2	41.1	38.4	34.4	31.9	28.9	25.5	23.5
Fair	868	70.7	61.6	57.6	52.8	47.1	43.9	39.6	35.4	32.0	28.5	24.5	24.1
Poor	501	69.0	61.6	56.4	53.6	44.6	42.0	38.2	31.0	28.4	26.0	19.8	20.2

Note: General health status was not included in the proxy questionnaire, so analysis for this variable is restricted to sample members who completed the personal interview at wave 1.

Table 14. EMB Attrition: General Office Region (GOR)

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
North East	64	54.9	60.9	61.0	38.0	39.7	35.4	33.8	16.9	27.1	25.8	28.0	22.8
North West	410	67.3	57.8	45.6	39.9	38.8	34.6	34.4	30.6	31.0	28.1	22.3	21.5
Yorks & Humber	473	73.1	60.7	56.0	53.1	44.4	47.6	41.4	35.8	34.0	26.8	21.7	24.7
East Midlands	325	73.5	65.7	58.7	58.9	51.7	45.3	41.8	35.0	28.6	26.6	21.4	23.0
West Midlands	767	66.4	57.1	55.0	50.7	44.4	41.9	36.4	30.5	28.9	23.4	20.2	20.8
East of England	314	71.3	61.2	56.4	52.7	39.8	41.1	38.2	32.3	32.5	30.6	26.1	23.3
Greater London	3,795	66.3	57.9	52.5	48.9	41.2	37.4	34.5	30.2	27.5	25.7	22.1	19.8
South East	314	71.5	62.7	56.1	52.4	43.2	41.4	38.6	35.1	31.7	29.9	24.9	27.4
South West	67	74.6	61.9	68.3	66.1	62.9	50.0	50.0	42.6	39.3	40.0	33.3	33.3
Wales	66	66.2	67.7	56.9	50.0	56.3	42.2	45.3	39.7	28.6	28.6	27.0	28.6
Scotland	31	50.0	62.1	48.3	35.7	39.3	39.3	42.9	33.3	33.3	29.6	18.5	22.2

Table 15. EMB Attrition: Personal Income in Quintiles

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Bottom quintile	2,190	64.9	55.0	49.6	46.4	38.8	34.8	32.7	27.9	25.2	22.9	18.8	18.0
Second quintile	1,306	66.4	58.6	53.1	48.0	42.4	38.3	35.2	30.1	28.6	25.1	20.2	19.3
Third quintile	1,092	71.0	62.8	55.3	51.8	44.1	41.9	38.1	33.4	30.6	27.7	24.6	23.3
Fourth quintile	1,071	70.1	58.5	54.2	49.8	43.9	40.8	37.4	32.8	30.0	27.9	24.5	23.5
Top quintile	964	69.1	64.4	60.0	56.8	47.7	46.6	42.3	36.9	35.2	32.6	28.2	26.6

Note: Income quintiles were derived from the variable a_fimngrs_dv, gross personal monthly income as reported at wave 1.

Table 16. EMB Attrition: Employment Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Self employed	416	65.2	60.0	56.1	50.8	44.5	39.9	34.8	29.5	27.0	23.5	22.4	21.0
Paid employment	2,669	67.9	60.5	55.2	52.1	44.2	41.7	38.6	33.3	31.2	29.7	25.9	24.5
Unemployed	752	64.6	55.2	48.4	46.7	39.9	37.0	34.3	30.8	28.5	26.2	21.5	20.8
Retired	498	70.4	64.8	59.5	55.0	47.9	42.3	39.3	35.5	32.1	27.8	22.7	21.1
Family care or home	961	71.3	62.4	56.8	50.5	45.7	43.5	40.6	34.4	31.9	27.1	22.0	21.6
Full-time student	1,032	65.0	51.7	46.4	42.2	33.9	29.5	27.0	23.5	20.6	19.0	15.0	14.2
Long-term sick or disabled & others	296	68.3	56.7	50.8	49.0	41.5	38.8	33.6	28.2	27.8	20.9	17.3	18.1

Note: Employment status derived from a_jbstat as reported in wave 1.

Table 17. EMB Attrition: Marital Status

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Single	2,527	62.6	52.9	47.5	44.1	36.2	33.4	30.3	26.5	23.7	21.5	18.1	17.2
Married	3,364	70.9	62.8	57.3	53.3	46.3	43.3	40.4	34.6	32.2	29.6	25.2	24.4
Separated/Divorced	514	69.8	62.2	57.2	53.5	48.4	43.2	37.8	35.1	32.7	29.3	26.2	23.1
Widowed	217	69.2	61.3	55.2	50.5	43.3	38.2	36.2	28.3	31.4	25.8	18.3	16.9

Note: Marital status derived from a_marstat as reported in wave 1.

Table 18. EMB Attrition: Highest Qualification

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
No qualifications	1,280	66.2	56.6	52.5	48.4	41.8	38.3	35.0	29.6	27.4	22.4	17.6	18.2
Other	468	71.1	64.1	57.9	53.0	46.8	43.5	40.5	34.9	32.6	30.2	25.8	22.9
GCSE or equivalent	1,193	67.7	58.6	52.0	47.3	39.9	36.4	33.7	29.1	25.4	23.2	18.5	18.5
A-level or equivalent	1,226	67.3	59.2	54.3	50.2	43.1	38.5	35.4	30.8	28.0	26.7	22.8	21.5
Degree or equivalent	2,437	68.1	59.3	53.6	50.8	43.2	41.3	37.9	33.1	31.6	29.2	25.9	24.0

Note: Highest qualification derived from a_hiqual_dv as reported in wave 1.

Table 19. EMB Attrition: Household Type

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
An adult, no children	678	65.0	57.0	51.5	47.4	40.8	37.7	34.5	31.6	29.6	27.0	24.6	22.7
An adult, children	578	71.7	62.5	54.9	50.3	43.3	36.9	34.9	31.4	27.0	23.2	19.9	18.2
Couple, no children	690	66.7	61.8	55.0	53.8	44.5	40.4	36.6	30.4	28.1	25.8	22.3	21.5
Couple, children	1,937	71.7	63.7	58.2	52.7	44.7	41.5	38.9	33.6	31.7	29.8	24.9	23.5
Two or more adults, no children	1,150	58.6	48.1	42.9	40.9	35.6	34.3	30.0	26.7	25.2	24.1	19.8	18.6
Two or more adults, children	1,593	68.9	58.8	54.7	51.1	44.3	41.4	38.2	32.0	29.1	24.8	21.0	20.9

Note: Household type derived from a_hhtype_dv in wave 1.

Table 20. EMB Attrition: Household Tenure

	Wave 1 (2009-11)	Wave 2 (2010-12)	Wave 3 (2011-13)	Wave 4 (2012-14)	Wave 5 (2013-15)	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Owned outright	1,000	69.9	61.3	57.3	53.7	49.4	43.5	40.7	38.4	35.5	32.0	26.5	27.5
Owned with mortgage	2,066	72.9	66.5	62.2	58.9	48.3	46.8	42.3	35.3	33.1	30.6	26.5	25.9
Local authority housing	1,961	67.1	59.4	53.2	47.2	41.0	37.3	34.4	29.6	26.9	23.6	20.4	19.0
Rented private	1,441	60.3	46.5	38.7	37.5	31.8	29.0	27.0	23.2	22.1	20.8	16.7	14.5
Other	109	47.3	41.1	40.4	37.1	36.0	31.5	33.0	33.0	28.4	23.0	21.8	17.2

Note: Household tenure derived from a_tenure_dv in wave 1.

Annex C: Attrition in the Immigration and Ethnic Minority Boost Sample

Notes to Annex B tables: Cells entries for wave 6 indicate the number of respondents to the adult interview in wave 6 (personal or proxy). The rest of the cells contain the response rate for the subgroup as the percentage of wave 6 respondents who completed the interview in that wave. Ineligible cases were removed from the response rates calculations and, as explained in the methods sections, further adjustments were implemented to deal with under-identified mortality. However, it is likely that remains some undetected ineligibility that might cause the underestimation of the response rates. The undetected ineligibility is likely to increase over time, especially in the oldest age groups of the sample.

Table 21 IEMB Attrition: Sex, Age and Ethnic Group

		Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Full sample		4,301	65.5	54.6	43.7	39.4	32.7	26.8	25.8
Sex	**Male**	1,964	62.4	51.6	40.5	35.6	29.6	23.1	22.9
	Female	2,337	68.0	57.2	46.3	42.4	35.3	29.8	28.1
Age at wave 6	**16-19**	345	66.0	48.8	38.3	32.6	27.7	21.8	17.6
	20-29	957	57.4	45.2	34.4	30.5	26.4	20.1	19.5
	30-39	1,140	66.4	57.3	45.2	39.6	31.7	27.9	26.2
	40-49	866	70.1	58.0	44.9	43.3	36.8	30.9	29.5
	50-59	507	68.3	56.7	49.7	43.4	37.8	29.7	32.3
	60-69	241	72.0	69.4	60.9	57.3	44.9	36.2	35.8
	70+	220	69.5	62.7	52.1	48.4	36.2	28.4	26.8
Ethnic group	**White**	961	63.3	53.3	43.5	39.9	32.7	25.8	23.8
	Black	1,005	61.6	50.3	36.9	30.4	25.4	19.7	17.7
	Indian	723	71.7	58.8	50.5	48.8	46.5	37.3	36.8
	Pakistani	658	73.1	64.3	53.5	48.1	35.7	30.0	33.9
	Bangladeshi	212	69.2	55.0	45.5	42.3	28.6	23.5	25.5
	Other Asian	289	51.6	45.0	32.2	30.5	27.1	23.3	15.7
	Mixed	221	65.9	55.9	43.3	40.1	33.2	34.3	29.6
	Other	229	63.5	48.2	35.8	28.6	23.3	20.0	19.3

Table 22. IEMB Attrition: General Health Status

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Excellent	1,035	61.8	49.4	39.7	36.6	31.0	26.1	22.9
Very Good	1,211	67.4	56.4	46.5	40.5	36.2	29.8	29.6
Good	1,067	68.6	58.2	46.8	42.1	35.4	28.6	27.3
Fair	383	69.1	63.4	49.2	47.2	35.1	29.9	30.7
Poor	188	69.4	54.7	46.3	44.5	31.5	23.3	24.1

Note: General health status was in the self-completion questionnaire and in the main questionnaire for proxy interviews, so for this analysis we combined both variables.

Table 23. IEMB Attrition: Government Office Region (GOR)

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
North of England & Scotland	620	75.3	57.9	52.5	47.8	31.9	23.7	29.5
Yorks & Humber	464	72.0	57.4	52.7	46.6	40.2	30.8	29.9
East Midlands	77	57.3	53.3	45.9	40.3	29.6	23.9	31.0
West Midlands	492	72.9	60.9	47.9	44.5	36.4	33.2	33.1
East of England	157	71.4	59.2	44.0	41.0	37.5	28.6	29.5
Greater London	2,095	58.6	50.2	36.9	33.2	28.7	23.6	20.2
South East	285	70.1	61.3	49.6	41.0	41.5	35.5	33.3
South West	111	65.7	57.7	48.5	46.8	37.2	39.1	32.2

Note: GOR had small counts in some cells, such as Scotland or North East, due to the sampling design of the IEMB, so these groups were combined with North West.

Table 24. IEMB Attrition: Personal Income in Quintiles

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Bottom quintile	862	63.3	47.8	37.3	32.4	26.2	21.8	18.5
Second quintile	859	64.2	52.5	44.7	40.2	32.8	24.6	26.5
Third quintile	860	65.0	55.9	44.7	39.7	32.0	27.8	25.9
Fourth quintile	860	69.9	59.0	46.1	43.1	36.6	30.0	28.5
Top quintile	860	64.9	57.9	45.4	41.3	36.0	29.8	29.5

Note: Income quintiles were derived from the variable f_fimngrs_dv, gross personal monthly income as reported at wave 6.

Table 25. IEMB Attrition: Employment Status

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Self employed	413	60.9	54.3	38.6	35.9	32.0	23.1	22.5
Paid employment	1,915	65.3	54.9	44.7	40.0	33.7	28.0	27.3
Unemployed	412	62.7	50.9	37.1	33.2	26.1	22.6	20.2
Retired	342	73.1	66.5	58.6	52.3	42.4	33.6	34.6
Family care or home	474	71.4	61.0	49.5	44.2	34.1	29.2	29.6
Full-time student	547	63.1	46.5	36.0	32.6	28.5	21.9	18.8
Long-term sick or disabled & others	172	64.9	51.5	43.3	41.6	34.4	32.1	29.9

Note: Employment status derived from f_jbstat as reported in wave 6.

Table 26. IEMB Attrition: Marital Status

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Single	1,683	62.7	50.1	38.2	34.0	29.2	23.5	21.2
Married	2,148	68.0	58.4	48.6	43.9	35.6	29.5	29.7
Separated/Divorced	293	67.8	54.6	40.9	38.8	34.1	27.9	26.2
Widowed	120	67.2	61.9	47.6	46.0	36.0	30.5	29.0

Note: Marital status derived from f_marstat as reported in wave 6.

Table 27. IEMB attrition: Highest Qualification (ISCED11)

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Primary or less	332	68.4	52.2	44.7	38.4	27.3	20.7	21.2
Secondary and post-secondary	1,688	65.3	54.7	43.7	39.1	31.9	25.4	24.4
Other higher	854	63.2	54.0	42.9	41.3	35.5	30.0	29.1
Degree	1,032	67.5	57.1	44.9	40.5	36.2	30.0	28.0
Other	292	69.2	58.0	48.2	39.3	30.3	26.3	26.6

Note: A substantive part of the IEMB obtained their qualifications out of the UK and they were asked using ISCED 11, an international classification developed by UNESCO. The education variable is a combination of the ISCED 11, for those getting their qualifications abroad, and the highest qualification obtained in the UK.

Table 28. IEMB Attrition: Household Type

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
An adult, no children	587	61.2	50.5	39.5	34.7	29.0	24.2	22.0
An adult, children	296	73.4	55.3	42.9	39.9	32.7	28.2	22.0
Couple, no children	573	62.8	52.9	44.2	43.3	34.9	27.2	27.7
Couple, children	1,075	72.6	62.5	49.8	44.1	37.1	31.7	30.1
Two or more adults, no children	1,018	58.3	47.3	37.8	34.3	28.7	23.5	23.8
Two or more adults, children	752	67.0	57.0	45.5	39.4	32.7	25.2	25.1

Note: Household type derived from f_hhtype_dv in wave 6.

Table 29. IEMB Attrition: Household Tenure Status

	Wave 6 (2014-16)	Wave 7 (2015-17)	Wave 8 (2016-18)	Wave 9 (2017-19)	Wave 10 (2018-20)	Wave 11 (2019-21)	Wave 12 (2020-22)	Wave 13 (2021-23)
Owned outright	643	76.1	68.3	60.5	57.4	49.3	42.3	42.3
Owned with mortgage	816	70.6	62.4	52.9	46.3	42.7	37.0	37.3
Local authority housing	1,110	68.7	57.0	42.9	37.9	29.4	23.9	22.6
Rented private	1,131	57.8	46.2	34.1	31.6	24.6	17.2	16.6
Other	113	60.0	36.7	30.5	30.5	21.9	21.2	14.4

Note: Household tenure derived from f_tenure_dv in wave 6.