

Evaluating push-to-web methodology for mixed-mode surveys using address-based samples

Peter Lynn, University of Essex

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Abstract

Mixed-mode push-to-web surveys are becoming increasingly popular as a means of combining the desirable but conflicting properties of different data collection modes. Specifically, encouraging as many sample members as possible to participate by web minimises costs, while the use of interviewer-administered modes to follow-up nonrespondents can result in improved response rates. However, push-to-web methodology is still in its infancy. Push-to-web is particularly challenging when only address lists are available as a sampling frame. The article reports the results of a randomised experiment with different ways of handling a) the invitation to all household members at each address, and b) the introduction of the mixed-mode nature of the survey. Furthermore, the push-to-web methods are compared with a traditional face-to-face approach. The experiments are carried out on a national general population sample. Push-to-web is found to be viable though response rates are slightly lower than with face-to-face. Few differences in outcomes are found between the different ways of handling the complexity of the survey context, leading to clear conclusions regarding preferred methods.

1 Introduction

1.1 Mixed-mode Surveys

Less than a decade ago, Dex & Gummy (2011) noted that while there was considerable interest in mixed-mode survey designs that involve a combination of web and interviewer-administered modes, very few major surveys had actually implemented such a design. Since then, web-interviewer mixed-mode designs have become increasingly common (de Leeuw, 2018). The attraction of such designs lies in the potential ability to obtain a better balance of survey costs and survey quality than would be possible with a single-mode design. Methodological research has addressed aspects of the design of such mixed-mode surveys (Al Baghal & Lynn, 2015; Becker & Glauser, 2018; Carpenter & Burton, 2018; Hox, de Leeuw, & Klausch, 2017; Lynn, 2019a; Olson, Smyth, & Wood, 2012) as well as evaluating the impacts of mixed-mode designs on outcomes such as measurement error, participation rates, sample composition and survey costs (Allum, Conrad, & Wenz, 2018; Bianchi, Biffignandi, & Lynn, 2017; Bowling, 2005; Dillman, 2009; Dillman, Smyth, & Christian, 2014; Kappelhof, 2015; Klausch, Hox, & Schouten, 2015; Kolenikov & Kennedy, 2014; Roberts, Joye, & Ernst Stähli, 2016; Schouten et al, 2013; Smyth, Olson, & Kasabian, 2014; Tourangeau, 2017; Villar & Fitzgerald, 2017).

Despite the growth of methodological research in recent years and the growth in implementation of web-interviewer mixed-mode surveys, many questions remain about how best to design such surveys. Research knowledge is sparse on such issues as how best to frame the initial invitation, how best to incentivise sample members to participate online rather than in an interviewer-administered mode, and how best to target different modes at different sample subgroups.

Push-to-web surveys (also known as “web-push” surveys) are defined by Dillman (2017) as “data collection that uses mail contact to request responses over the Internet, while withholding alternative answering modes until later in the implementation process.” In practice, the initial request may be made by email instead of, or as well as, mail, depending on the contact information available in advance of data collection. A push-to-web design need not necessarily involve any interviewer-administered mode: it could for example involve a combination of web and mail questionnaires (e.g. Bosnjak et al, 2017; Smyth et al, 2010). Similarly, a web-interviewer mixed-mode design need not use push-to-web methods: the web option might instead be offered concurrently or as a nonresponse follow-up (De Leeuw et al, 2008). However, this article is concerned with survey designs that possess both of these design features, in other words push-to-web web-interviewer mixed-mode surveys. We focus particularly on two circumstances in which the design of such surveys raises methodological issues on which previous research is sparse or non-existent:

- a) The use of a sampling frame of addresses, with no information about the number or names of residents;
- b) The objective to include all (adult) household members in the survey.

Each of these circumstances is fairly common, and the two sometimes occur in combination, as in the case of the survey which provides the data used in this article. The use of a sampling frame of addresses is common practice for general population surveys in countries where there is no available population register. For example, 9 out of 23 countries taking part in Round 8 of the European Social Survey in 2016-17 used an address list as the sampling frame (Lynn, 2019b). The objective of including all household members in the survey tends to arise when intra-household relationships are important or when household aggregate measures are best derived from individual reports, as in the EU-SILC (Wolff, Montaigne, & González, 2010), in which household measures of income are derived from individual reports, and household panel surveys (Rose, 2000) where a range of intra- and inter- household dynamics are of interest. The methodological issues raised by these circumstances are outlined in the next section. Section 3 then describes the design of the study reported here, section 4 presents findings, and section 5 provides a discussion of implications for survey practice and future avenues for research.

2 Issues in Push-to-web Methodology

2.1 Inviting all Household Members

Push-to-web methodology is particularly challenging when the sampling frame provides only addresses and not names of individuals. For surveys that wish to include one randomly-selected person per

household it is necessary to instruct the recipient of the mailing on how to select a household member to act as respondent (Nicolaas et al, 2014). Studies have shown (Park & Humphrey, 2014; Villar, 2013; Williams, 2014) that a wrong selection is made, either deliberately or accidentally, in a large proportion of households. For surveys that wish to include all household members, the question arises of how to introduce and manage the invitation to all household members. The question is complicated if the survey wishes to offer an incentive to each sample member. Incentives have been shown to be effective for push-to-web surveys and for self-completion surveys generally (Singer & Ye, 2013). Researchers may be concerned that stating in the invitation letter that all household members are invited to participate, and that each will be sent an incentive, might encourage some people to over-state the number of members of their household in order to earn extra incentives. This would effectively result in fake interviews (Coczela et al, 2015; Murphy et al, 2016) and would likely damage survey estimates.

The obvious alternative is to state - or imply - that any household member can complete the (initial) questionnaire and to include in this questionnaire a household listing, from which the other eligible household members can be identified and invited subsequently to participate. Another potential advantage of this second approach is that it avoids the necessity to request a household listing at the first step, a request that can appear intrusive and may negatively impact response rates (Menold, 2014; Eckman & Koch, 2019). However, a potential disadvantage is that some respondents may feel that they should have been warned in the initial letter that all household members were to be invited. This could have a negative impact on co-operation. In summary, each of the two approaches – stating upfront that all household members are to be invited or announcing this only after the household grid has been completed – has potential advantages and disadvantages and it is unclear where the balance lies, particularly in terms of the effect on participation rates, and the potential for fake interviews.

2.2 Introducing the Mixed-mode Design

Similar uncertainty exists regarding how and when to inform survey households that an interviewer will call at their address to seek a face-to-face interview in the event that they do not participate online. On the one hand, not mentioning this in the initial letter might maximise the proportion of sample members participating online. If recipients knew that a face-to-face interview was an option, some might delay responding online, either because they actively prefer a face-to-face interview or simply because inaction is more likely when faced with a choice of actions (Medway & Fulton, 2012). On the other hand, sample members who are unable or unwilling to participate online may react badly to being invited to an online survey and may therefore be less willing to co-operate, even when subsequently contacted face-to-face. There may therefore be a case for mentioning in the invitation letter that there will be an opportunity to be interviewed in person if the recipient is unable to participate online. This approach might also encourage online participation by people who wish to avoid having an interviewer visit their home. Though both approaches have been used in sequential mixed-mode surveys, there does not appear to be any empirical evidence on their relative merits.

3 Study Design

3.1 The Understanding Society Innovation Panel

The Innovation Panel (Jäckle et al, 2017) is a household panel survey that exists for the purpose of methodological testing and development in the context of Understanding Society: The UK Household Longitudinal Study (University of Essex, Institute for Social and Economic Research, 2018). It is based on a multi-stage stratified probability sample of households, clustered within 120 primary sampling units. Data collection has taken place annually since 2008. A refreshment sample of households has been added to the panel in 2011, 2014, 2017 and 2018, in all cases selected from within the same set of 120 PSUs.

At each annual wave data collection begins for each household with completion of a household grid, collecting basic details of each current household member. Then, one adult householder completes a household questionnaire focused mainly on details of the accommodation and housing costs. Subsequently, each adult completes an individual questionnaire with questions on education, employment, health, family circumstances and other socio-economic topics. Typically, the household questionnaire takes between 5 and 15 minutes to complete and the individual questionnaire between 25 and 45 minutes.

The first four waves of data collection relied on face-to-face interviewing (aside from an experiment with telephone interviewing at wave 2: Lynn, 2013), but from wave 5 (2012) a mixed mode design was introduced, involving web questionnaires as well as CAPI and CATI (Jäckle, Lynn & Burton, 2015). However, sample members were only invited to complete a web questionnaire after they had already been in the panel, administered by CAPI, for at least one wave. Thus, for example, the 2011 refreshment sample, first included at wave 7, was first invited to respond by web at wave 9.

The study reported here is based on the 2018 refreshment sample, for which 21 addresses were selected in each PSU, giving a total sample size of 2,520 addresses. All households resident at those addresses are included in the study.

3.2 Push-to-web vs. CAPI

The 2,520 sample addresses were allocated systematically to two experimental groups. Two-thirds of addresses (14 per PSU; 1,680 in total) were allocated to the “CAPI-first” group and one-third (7 per PSU; 840 in total) to “web-first”. The web-first group would be the first households in the Innovation Panel ever to have been invited directly to a web interview without first having experienced at least one wave of CAPI interviewing.

An invitation letter was sent to each address in the CAPI-first sample, providing basic information about the survey and informing the residents that an interviewer will visit to seek personal interviews. A few days later, interviewers began visiting sample addresses to seek CAPI interviews. After several weeks of CAPI fieldwork, any sample households that had not yet participated (or had only partially participated

with, for example, one household member yet to provide an individual interview) were invited by mail to take part online.

A similar invitation letter was sent to each address in the web-first sample, providing the same basic information about the survey but inviting participation in a web survey (see also section 3.3 below). The letter included the survey URL and a unique login code. After three weeks, CAPI interviewers began visiting the addresses of households that had not yet participated (or had only partially participated).

Of the 2,520 sample addresses, 160 turned out to be ineligible (vacant, non-residential, second homes, or otherwise not containing a resident household). At the remaining 2,360 addresses, 12 additional households were found at multi-household addresses, making an eligible base of 2,372 households. Analysis of survey outcomes is therefore based on 1,588 CAPI-first addresses and 784 web-first.

3.3 Inviting all Household Members

The web-first sample was randomly allocated to one of two treatments, which differed in terms of the point in the survey process at which sample members were informed that all adult sample members are requested to participate in the survey. In the “upfront invite” group (n = 395 households), the initial invitation letter sent to the sample address included a £10 unconditional incentive and a promise of an additional £15 for each person in the household (aged 16 or over) who completes the questionnaire online within three weeks. In the “post-grid invite” group (n = 389 households), the initial invitation letter included a £10 unconditional incentive and a promise of an additional £15 “if you complete the questionnaire online within three weeks”.

In both groups, upon completion of the household grid, and if more than one adult was recorded in the household, a screen conveyed a message stating “We would like to invite <name> to take part in the survey too. They too will receive £15 for doing so by <date>. Please either enter their email address (we will email them their own personal invite) or click here to print an invitation letter with their own unique entry code.” Thus, for the post-grid invite group, this was the first moment at which the initial respondent would have become aware that other household members were to be asked to participate. In the upfront invite group, the initial respondent would have been aware of this feature of the survey since reading the invitation letter.

In both groups, households that had not yet participated received reminder letters after 7 and 15 working days, again mentioning the £15 conditional incentive and the deadline.

3.4 Introducing the CAPI Follow-up

The second experiment with the web-first sample also involved random allocation to two groups. Allocation was orthogonal to the groups for the first experiment. Table 1 shows the distribution of the sample across the four groups formed by the cross-classification of the two experiments.

In the “explicit CAPI” group (n = 402 households) the invitation letter stated that if the recipient was unable to participate online, there would be an opportunity to be visited by an interviewer for an in-home personal interview instead. The first reminder letter again mentioned the interviewer visit option.

In the “delayed CAPI” group (n = 382 households) neither the invitation letter nor the first reminder letter mentioned the interviewer visit option. For both groups, the second reminder letter to non-responding households announced that an interviewer will visit to request an in-person interview and that each person who takes part, either face-to-face or online, would receive £10. Copies of the invitation letter for all four web-first groups are reproduced in appendix A.

Table 1
Experimental allocations

	Sample addresses	(Less) ineligible	(Plus) additional households	Total eligible households
Total sample	2,520	160	12	2,372
CAPI-first	1,680	102	10	1,588
Web-first:				
upfront invite, explicit CAPI	210	10	2	202
upfront invite, delayed CAPI	210	17	0	193
post-grid invite, explicit CAPI	210	10	0	200
post-grid invite, delayed CAPI	210	21	0	189

4 Results

4.1 Push-to-web compared to CAPI-first

The household response rate (Table 2) was slightly lower with the web-first protocol than with the CAPI-first protocol, but the difference was not statistically significant at the 5% level. However, the difference between the mode protocols in the proportion of households responding fully (household grid, household interview and all individual interviews completed) was larger and was statistically significant (16.8% CAPI-first vs. 12.2% web-first, $P = 0.010$). The experiment therefore provides evidence that the web-first protocol might not be as successful as the CAPI-first protocol at achieving complete household participation. The size of the effect may be considered modest in absolute terms (a 4.6 percentage point difference in response rates) but corresponds to a relative increase in response of more than one-third. It should be noted that this difference in outcomes cannot be explained by a difference in field effort between the two groups. The CAPI field period was the same for both groups, as the web-only phase for the web-first group started five weeks before the start of CAPI field work, which started and ended at the same time for both groups. Moreover, the mean number of contact attempts at non-contacted addresses did not differ between the groups (4.23 for CAPI-first addresses and 4.33 for web-first addresses).

There were clear differences - unsurprisingly - in the mode of response between the groups. Amongst participating households, the proportion who responded (at least partly) by web was 37% in the web-first group but only 2% in the CAPI-first group. However, the overall proportion of households in the web-first group who provided a complete response by web was only 4% (34.9% of the 12.2% who provided complete responses), meaning that 96% of sample addresses still had to be visited by a CAPI interviewer. Though additional cost savings accrued from a reduction in the proportion of interviews that were interviewer-administered - from 98.3% to 67.4% - overall cost savings were modest compared to CAPI-first.

Table 2
Response rates and mode of response; CAPI vs. push-to-web

	CAPI-first	Web-first	P
Household response (%)	25.1	22.5	0.16
Complete response (%)	16.8	12.2	0.01
Mode of response (household):			
CAPI only (%)	98.2	62.9	0.000
Web only (%)	1.0	34.9	0.000
CAPI and web (%)	0.8	2.3	0.18
Mode of response (individual):			
CAPI with proxy (%)	6.2	3.7	0.17
CAPI in person (%)	92.1	63.7	0.000
Web (%)	1.7	32.6	0.000

Only small differences were observed in the characteristics of the responding samples between the CAPI-first and web-first protocols. Differences were tested in terms of a set of 28 available socio-demographic, economic and health measures, listed in Appendix B. First, bivariate tests were carried out using the `svy` prefix command in Stata, to take into account the survey design. Design-based F-tests were used in the case of categorical variables, and t-tests for linear regression coefficients in the case of continuous variables. Of the 28 variables tested, only two showed a significant association ($P < 0.05$) with the mode protocol. This result is close to what would be expected by chance (1.4) if all true associations were zero. All 28 variables were then entered stepwise into a logistic regression model in which the mode protocol was the dependent variable. The same two variables remained significant ($P < 0.05$) in the final model (Table 3). The model suggests that participation was more likely with the web-first protocol for people under pensionable age living alone and for people in households containing four or more children. However, little weight should be put on these findings given that these outcomes could easily have been observed by chance.

4.2 Inviting all Household Members

Response rates were not affected (Table 4) by whether the explanation that all adult household members will be requested to participate was made upfront in the invitation letter or delayed until after the household grid had been completed. There was however a suggestion that more household members were recorded with the upfront invite (in 7.6% of households, four or more adults were recorded, compared to 1.1% in the post-grid invite group; $P = 0.04$; Table 4). This is consistent with the hypothesis that mentioning upfront that all adult household members will be requested to participate and – crucially – explaining that each will receive £15 for completing the questionnaire may cause some recipients to deliberately overstate the number of members of the household in order to receive additional payments. However, it is not clear that deliberate overstating is the mechanism that has led to the observed difference in distributions of household size, given that a full response by all adults in the household was obtained in only two of the six households with four or more adults in the upfront invite group (both households with exactly four adults). In “large” households (four or more adults), 14 out of 28 adults in the upfront invite group completed individual interviews, compared to 1 out of 4 in the post-grid invite group. Therefore, the potential incentive payments that could have been earned in these apparently large households were, largely, not realised.

Table 3
Logistic regression model predicting mode protocol; respondents

	Odds ratio	Standard error	P
Number of children in household (Ref=0):			
1	1.055	0.276	0.84
2	1.606	0.500	0.13
3	1.886	1.699	0.48
4 or more	0.159	0.125	0.02
Adults in the household (Ref=2 or more):			
1, of pensionable age	1.054	0.325	0.87
1, under pensionable age	0.488	0.121	0.01
Constant	3.062	0.479	0.00

Note: dependent variable is coded 1 for CAPI-first, 0 for web-first. Thus, odds ratios greater than 1.0 indicate that respondents with this characteristic are more likely to be CAPI-first than web-first, and vice versa. Model fitted in Stata 15.1 using svy: logit to take into account the complex sample design.

Table 4

Response rates and reported number of household members; upfront vs. post-grid invite

	Upfront invite	Post-grid invite	P
Household response (%)	21.5	23.4	0.47
Complete response (%)	10.9	13.6	0.22
Number of adults in household:			
1	38.0	44.4	0.38
2	50.6	45.6	0.49
3	3.8	8.9	0.13
4 or more	7.6	1.1	0.04

4.3 Introducing the CAPI Follow-up

Whether or not sample households were notified from the outset that there would be a face-to-face follow-up if they did not participate online had no observable effect on response rates (Table 5). However, notifying upfront had an effect of borderline significance ($P = 0.08$; Table 5) on the mode of participation, with more households participating (at least partly) online if they knew there would be a CAPI follow-up. This is consistent with the idea that some people might be willing to complete a web survey in order to avoid having an interviewer visit their home.

Table 5

Response rates and mode of participation; explicit vs. delayed announcement of CAPI phase

	Explicit CAPI	Delayed CAPI	P
Household response (%)	23.1	21.7	0.63
Complete response (%)	11.9	12.6	0.81
Mode of response: Web (%)	43.0	30.5	0.08

4.4 Who responds online?

In a push-to-web design, a prime motivation for including the follow-up phase with a different data collection mode is to avoid the sample composition bias that would likely manifest itself if the survey were web-only. Nevertheless, knowledge of the composition of the sample that responds online is of interest to researchers as this may help us to understand why people do or do not respond to our web-push and consequently to identify approaches that may help to encourage higher levels of online participation in future.

Using the same set of 28 socio-demographic, economic and health measures that were used in section 4.1 to compare respondents with the web-first protocol to respondents with the CAPI-first protocol (listed in Appendix B), we here restrict analysis to the web-first sample and compare those who responded online with those who participated in a CAPI interview. The analysis methods were the same as described in section 4.1, resulting in a logistic regression model with four significant predictors (Table 6). The characteristics associated with a lower propensity to have responded online (and therefore a greater propensity for the costly face-to-face interviewer follow-up to have been necessary) are being aged 60 or over, having one child aged under 16 in the household, not having a degree-level qualification and having a long-standing illness or disability,

Table 6
Logistic regression model predicting mode of response; respondents to web-first protocol

	Odds ratio	Standard error	P
Age (Ref= 16-59):			
60 or above	-1.470	0.440	0.002
Number of children in household (Ref=0):			
1	-2.622	0.825	0.004
2 or more	-0.719	0.526	0.18
Highest qualification (Ref=degree or above):			
Lower than degree, or none	-0.984	0.412	0.02
Long-standing illness or disability (Ref=Yes):			
No	0.767	0.337	0.03
Constant	-0.523	0.688	0.45

Note: dependent variable is coded 1 for online response, 0 for CAPI. Thus, odds ratios less than 1.0 indicate that respondents with this characteristic are less likely to respond online than by CAPI, and vice versa. Model fitted in Stata 15.1 using svy: logit to take into account the complex sample design.

5 Discussion

Overall, the push-to-web protocol performed fairly well relative to the CAPI-first protocol, though the complete household response rate - the proportion of households in which all persons participated - was lower. There were no significant differences between the two protocols in sample composition. This is somewhat promising in terms of the future prospects for push-to-web surveys. However, overall response rates were relatively low with both protocols, so while the relative performance of push-to-web was good, the absolute performance leaves a little to be desired. Furthermore, cost savings with push-to-web were modest, as 96% of sample addresses still required an interviewer visit, though the

proportion of interviews that were interviewer-administered was considerably reduced (from 98% to 67%).

In addition to demonstrating the overall comparable performance of the push-to-web protocol, this study has also provided useful evidence on how best to deal with two specific issues that arise in the implementation of push-to-web surveys in particular contexts. First, delaying until after the household grid had been completed introduction of the fact that all adult household members were to be invited to participate (“post-grid invite”) did not damage response rates. In fact, the proportion of identified household members who completed the individual interview was higher with this approach. Given that this approach avoids the risk of over-stating household size (and potentially faking interviews) in order to earn extra incentive payments, this would appear to be the preferred approach. Second, mentioning in the invitation letter that an interviewer would be in touch if the recipient did not participate online (“explicit CAPI”) increased the proportion of questionnaires completed online without damaging response rates. The message would appear to act as an incentive to respond online in order to avoid an interviewer home visit. As this reduces survey costs and is consistent with push-to-web ideology, this approach should be preferred to the alternative of delaying mention of an interviewer visit until the end of the web-only data collection phase. These two findings should help researchers to better design push-to-web surveys with interviewer follow-up in future.

The findings are certainly consistent with Dillman’s (2017) conclusion that “... it seems likely that web-push data collection methods will see increased use throughout the industrialized world, as survey sponsors seek to benefit from the low cost of internet data collection in order to lower the overall cost of current surveys.” However, researchers should be cautious in adopting web-push methods, especially when the approach is intended to substitute, or be comparable with, an interviewer-administered approach. Further research is needed to identify ways to boost overall response rates, to produce a more balanced sample of respondents, and to identify ways to encourage higher proportions to participate online. With respect to the latter, this study has identified some demographic characteristics that are associated with under-representation amongst online respondents. Future research might usefully consider ways of encouraging sample members with these characteristics, for example through targeted motivational messages, incentives or additional support to access the online survey.

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Appendix A: Invitation Letters

Post-grid invite, explicit CAPI version:



<RESP_Name>
<Add1>
<Add2>
<Add3>
<Add4>
<Add5>
<Postcode>



<FinalSerialNum/Chi
FF_person/FF_PID>

Contact us:

0800 252 853
www.understandingsociety.ac.uk
contact@understandingsociety.ac.uk

<Date>

Tell us how life in the UK is changing

Dear <RESP_Name>,

Your household has been selected to take part in Understanding Society, the world-renowned research study. We would like to invite you to take part in a short research interview.

Every year, we speak to thousands of helpful households across the country to build a picture of life in the UK. We ask people about things like their home and family, work and school, and health and wellbeing. The information you share helps us to understand what people think, feel and do. It also helps us to see how society is changing over time.

Leading charities, like Citizens Advice, Age UK and the Children's Society, use the data to support their work. So do top universities and the UK government. This helps them to take the lives of real people into account when making decisions.

How to take part

Taking part is quick and easy. Just follow the following three steps.

1. Visit www.understandingsociety.ac.uk/society
2. Enter your username: <username> and password: <password>
3. Answer the questions in your own time

Your voice matters

Your participation will help to give a voice to your household, and thousands of people like you. You can help us understand how UK society is changing, and how to change things for the better. We rely on your goodwill and cooperation to make this study a success.

Thank you

To say thank you for taking part, we've enclosed a **£10 gift-card**, which you can spend at high-street shops like Argos, Marks & Spencer, and WHSmith. If you take part by <Early_bird_date>, you'll receive a £15 gift-card on top of the £10.

If you are unable to complete the questionnaire online, one of our research interviewers will be in touch with you to arrange a convenient time to take part in person.

We look forward to hearing from you soon.

A handwritten signature in black ink that reads "Michaela Benzeval".

Professor Michaela Benzeval
Director, Understanding Society
Institute for Social and Economic Research, University of Essex

IP11 CAWI D

This study is being conducted in accordance with the Data Protection Act. This means your personal details will be kept strictly confidential and you and your household will not be identifiable from the data.

Alternative versions of final paragraph.

upfront invite, explicit CAPI version:

Thank you

To say thank you for taking part, we've enclosed a **£10 gift-card**, which you can spend at high-street shops like Argos, Marks & Spencer, and WHSmith. If you or anyone else in your household aged 16 or over takes part by **<Early_bird_date>**, you'll each receive a £15 gift-card on top of the £10.

If you are unable to complete the questionnaire online, one of our research interviewers will be in touch with you to arrange a convenient time to take part in person.

We look forward to hearing from you soon,

upfront invite, delayed CAPI version:

Thank you

To say thank you for taking part, we've enclosed a **£10 gift-card**, which you can spend at high-street shops like Argos, Marks & Spencer, and WHSmith. If you or anyone else in your household aged 16 or over takes part by **<Early_bird_date>**, you'll each receive a £15 gift-card on top of the £10.

We look forward to hearing from you soon,

Post-grid invite, delayed CAPI version:

Thank you

To say thank you for taking part, we've enclosed a **£10 gift-card**, which you can spend at high-street shops like Argos, Marks & Spencer, and WHSmith. If you take part by **<Early_bird_date>**, you'll receive a £15 gift-card on top of the £10.

We look forward to hearing from you soon,

Appendix B: Variables included in tests of sample composition

Sex: male, female;

Age: 16-19, 20-29, 30-39, 40-49, 50-59, 60-69, 70 or over;

Highest qualification: degree or higher, other further, A-levels or equivalent, GCSE or equivalent, other, none;

Ethnic group: white British or Irish, other;

Country of birth: UK, other;

Legal marital status: single, married or with civil partner, widowed divorced or separated;

Urbanicity: urban, rural;

Total number of persons in the household: 1, 2, 3 or more;

Dwelling type: house or bungalow, flat or other;

Housing tenure: owned outright, owned with mortgage, social renting, private renting;

Internet access at home: yes, no;

Landline telephone in dwelling: yes, no;

Number of cars/vans in the household: 1, 2, 3 or more;

Number of adults in household: 1 of pensionable age, 1 under pensionable age 2 or more;

Number of children in household: 0, 1, 2, 3, 4 or more;

Number of people of pensionable age in household: 0, 1, 2 or more;

Number of employed persons in the household;

Gross household monthly income: first decile, 2nd to 9th deciles, top decile;

Did paid work in the past week: yes, no;

In paid employment: yes, no;

In receipt of basic state benefits: yes, no;

Long-standing illness or disability: yes, no;

Visits to GP in past 12 months: none, 1-2, 3-5, 6-10, more than 10;

Smoker: yes, no;

Carer for someone in household: yes, no;

Subjective wellbeing (GHQ scale 1 to 36);

Physical health (SF-12 physical component summary score);

Mental health (SF-12 mental component summary score).