SURVEY FUTURES

SURVEY DATA COLLECTION METHODS COLLABORATION

Working Paper 10:

Effectiveness of the knock-to-nudge approach for establishing contact with the respondents: Evidence from the National Readership Survey in the UK

Olga Maslovskaya[1], Cristian Domarchi[1], Peter W. F. Smith[1]

[1] University of Southampton

November 2025

www.surveyfutures.net

Survey Futures is an Economic and Social Research Council (ESRC)-funded initiative (grant ES/X014150/1) aimed at bringing about a step change in survey research to ensure that high quality social survey research can continue in the UK. The initiative brings together social survey researchers, methodologists, commissioners and other stakeholders from across academia, government, private and not-for-profit sectors. Activities include an extensive programme of research, a training and capacity-building (TCB) stream, and dissemination and promotion of good practice. The research programme aims to assess the quality implications of the most important design choices relevant to future UK surveys, with a focus on inclusivity and representativeness, while the TCB stream aims to provide understanding of capacity and skills needs in the survey sector (both interviewers and research professionals), to identify promising ways to improve both, and to take steps towards making those improvements. Survey Futures is directed by Professor Peter Lynn, University of Essex, and is a collaboration of twelve organisations, benefitting from additional support from the Office for National Statistics and the ESRC National Centre for Research Methods. Further information can be found at www.surveyfutures.net. This paper is a product of *Survey Futures* research strand 4, "Methods for surveys without field interviewers", led by Professor Olga Maslovskaya (University of Southampton).

Prior to citing this paper, please check whether a final version has been published in a journal. If so, please cite that version. In the meanwhile, the suggested form of citation for this working paper is:

Maslovskaya O, Domarchi C & Smith PWF (*2025*) 'Effectiveness of the knock-to-nudge approach for establishing contact with the respondents: Evidence from the National Readership Survey in the UK', *Survey Futures Working Paper* no. 10. Colchester, UK: University of Essex. Available at https://surveyfutures.net/working-papers/.

Contents

Abstract 5
1 Introduction 6
2 Data 7
2.1 The PAMCo Survey 7
2.2 Sample design 7
2.3 Fieldwork 7
3 Research questions 8
RQ1: Does the knock-to-nudge stage in recruitment helps improve response rates? 9
RQ2: Does the knock-to-nudge stage help improve sample composition? 9
RQ3: Do participants recruited via knock-to-nudge provide data of comparable quality to those recruited at the initial stage? 9
RQ4: Do participants recruited via knock-to-nudge differ from those recruited during the initial stage in their readership habits? 10
4 Methodology 10
4.1 Response rates (RQ1) 10
4.2 Sample composition (RQ2) 11
4.3 Item non-response (RQ3) 12
4.4 Substantive outcomes: Readership indicators (RQ4) 12
5 Results 14
5.1 Response rates (RQ1) 15
5.2 Sample composition and representativeness (RQ2) 15
5.3 Item non-response (RQ3) 17
5.4 Substantive variables (RQ4) 19
6 Discussion 21
References 24
Appendix 28

Effectiveness of the knock-to-nudge approach for establishing contact with respondents: Evidence from the National Readership Survey (PAMCo) in the UK

Olga Maslovskaya* , Cristian Domarchi*, Peter W. F. Smith*

*Department of Social Statistics and Demography, University of Southampton, University Road, Southampton, SO17 1BJ, United Kingdom, E-mail: om206@soton.ac.uk

Authors

Olga Maslovskaya is Professor of Survey Methodology and Social Statistics at the Department of Social Statistics and Demography, University of Southampton, University Road, Southampton SO17 1BJ, UK.

Cristian Domarchi is a Research Fellow at the Department of Social Statistics and Demography, University of Southampton, University Road, Southampton SO17 1BJ, UK.

Peter W. F. Smith is Professor of Social Statistics at the Department of Social Statistics and Demography, University of Southampton, University Road, Southampton SO17 1BJ, UK

Acknowledgements

The work was supported by the UK Research and Innovation (UKRI)/Economic and Social Research Council (ESRC) research grant ES/X014150/1 for "Survey data collection methods collaboration: securing the future of social surveys", known as Survey Futures. Survey Futures is directed by Professor Peter Lynn, University of Essex, and is a collaboration of twelve organisations, benefitting from additional support from the Office for National Statistics and the ESRC National Centre for Research Methods. Further information can be found at www.surveyfutures.net. We would also like to extend our sincere gratitude to Ipsos UK for facilitating access to the data in our analysis and for helping us understand the survey design and data collection processes.

Word count = 6137 (+ tables, figures, references, and appendices)

Abstract: 274

Abstract

The knock-to-nudge (KtN) approach was introduced in the UK during the COVID-19 pandemic as an innovative method to enhance response rates in self-administered high-quality, probability-based surveys. This protocol includes face-to-face interviewers visiting sampled households to encourage participants to take part in a non-face-to-face survey at a later date. Initially implemented as a response to the COVID-19 restrictions, KtN proved successful in boosting response rates, and several UK agencies continued its use post-pandemic. However, the literature has not yet systematically evaluated how KtN affects sample representativeness, data quality, and substantive survey variables. We examine these aspects using data from the National Readership Survey (PAMCo), a mixed-mode survey that employs a two-stage recruitment process. The initial stage involves mail contact (invitation plus two reminders), with participants responding online or via a paper questionnaire. Non-responding households then receive personal visits, where interviewers first offer computer assisted-personal interviews (CAPI). Online and paper alternatives are offered to respondents only if they refuse the CAPI option. This final recruitment phase is referred to here as KtN. Our findings demonstrate that the KtN recruitment phase is associated with: (1) a significant increase in response rates, (2) improved sample composition, (3) higher item non-response, and (4) a greater proportion of respondents who do not read newspapers and magazines. These results suggest that KtN can be an effective tool for enhancing participation and representativeness in self-administered surveys. However, its viability as a universal solution for mixed-mode surveys depends on whether these methodological benefits outweigh the potential compromises in data quality and the additional implementation costs. As this approach is still very new, further research is needed to explore its effectiveness in other contexts.

Keywords: knock-to-nudge, online surveys, mixed-mode surveys, self-administered surveys, survey recruitment, sample composition, data quality

1 Introduction

Face-to-face interviewing has traditionally been considered the gold standard for high-quality survey data collection. It enables interviewers to improve contact and cooperation rates, control household and respondent selection, and obtain more reliable information by building rapport and guiding respondents through the survey. However, declining response rates, increasing fieldwork costs, and increased internet penetration have reduced its predominant role in social and market research (Schober 2018; Kunz, Daikeler, and Ackermann-Piek 2024). The shift to mixed-mode designs, including self-administered modes that do not require interviewers, has long been encouraged (Dillman 2020; Luijkx et al. 2021; Wolf et al. 2021), and the COVID-19 pandemic further accelerated the need for more innovative approaches to adapt to a rapidly changing data collection landscape (Eurostat 2020; Kastberg and Siegler 2022).

While many high-quality UK surveys historically relied on face-to-face interviewing, pandemic-related restrictions led to significant methodological changes (Kastberg and Siegler 2022). During national lockdowns, data collection was largely paused, and several surveys adopted push-to-telephone modes. Recruitment initially remained mostly mail-based, with increased incentives to encourage respondents to provide contact details for interviews in alternative modes. Response rates declined substantial - by 12 percentage points in the Living Costs and Food Survey and the Wealth and Assets Survey, and by 26 percentage points for the Labour Force Survey (Kastberg and Siegler 2022).

The knock-to-nudge (KtN) approach was introduced during a period of relaxed COVID-19 restrictions as a strategy to increase response rates. KtN refers to a contact method in which interviewers visit sampled households and encourage respondents to participate later in a non-face-to-face survey (typically online or by telephone). An appointment may be arranged for a telephone interview, or respondents are encouraged to complete an online or paper questionnaire (Cornick et al. 2022; Kunz, Daikeler, and Ackermann-Piek 2024).

KtN has two key features: it uses face-to-face interviewers (who *knock*) to encourage (*nudge*) participation in a remote mode (Smith 2020, 2022; IEA 2025). Interviewers may collect phone numbers or do household selection of individuals if required. While they may also collect basic observations or other paradata (as recommended by Kunz, Daikeler, and Ackermann-Piek 2024), no substantial data collection takes place during this contact. The main survey is completed later.

Originally developed in response to COVID-19 restrictions, KtN was discontinued in some surveys once those restrictions were lifted. However, several high-quality UK surveys have retained this approach, adapting it to their evolving fieldwork designs (Domarchi, Maslovskaya, and Smith 2025). For example, the National Survey for Wales (NSW) and the Transformed Labour Force Survey (TLFS) have continued to use KtN beyond the pandemic (Jenkins and Forbes 2024; Siemiatkowska and Gilliland 2025). These surveys differ in both contexts and implementation – NSW uses a push-to-telephone design, while TLFS uses push-to-web (Jenkins and Forbes 2024; Siemiatkowska and Gilliland 2025).

The National Readership Survey, also known as PAMCo (Publishers Audience Measurement Company - the governing body overseeing audience measurement for the published media industry), adopted another variation of the KtN approach. PAMCo uses a mixed-mode design, inviting respondents to complete the survey online or via a paper questionnaire. For non-responding households, interviewers conduct follow-up visits and initially offer a computer

assisted-personal interview (CAPI) on the spot. If declined, respondents are encouraged to complete the survey later online or on paper. While this aligns with KtN principles by promoting remote participation, it differs by incorporating CAPI into the non-response follow-up (Ipsos 2023).

Interest in KtN is growing among survey methodologists, but evidence on its effectiveness – particularly across different implementations – remains limited in both research and practice (Domarchi, Maslovskaya, Smith 2025). This paper addresses this gap.

This paper examines the data collection process of the PAMCo survey to assess whether the KtN stage improves (1) response rates, (2) sample composition, (3) data quality in selected indicators, and (4) substantive survey outcomes. Although the study is tied to PAMCo design, it offers broader insights into whether KtN can serve as a viable recruitment strategy for high-quality probability-based surveys - especially as they move towards reduced reliance on field interviewers.

The paper is structured as follows: Section 2 outlines the design, sample strategy, and sample methods used in the PAMCo survey. Sections 3 and 4 outline the research questions and analytical approach. Section 5 presents the findings, and Section 6 discusses their significance, implications, and limitations, offering recommendations for future research.

2 Data

2.1 The PAMCo Survey

The PAMCo survey provides media publishers with data on audience reach, frequency, and demographics across both print and digital platforms (Ipsos 2023). Data are collected continuously through the year via a high-quality, probability-based survey of approximately 22,000 participants annually. Our analysis employs data from the 2022 PAMCo survey, collected between 4 January 2022 and 3 January 2023. The questionnaire covers readership of various published media, along with lifestyle habits, shopping behaviour, internet usage, and standard socio-demographic questions.

2.2 Sample design

The PAMCo sample is designed to represent the adult population aged 15 years or over living in households across England, Wales, and Scotland. In 2022, a two-stage sampling design was used: first, sampling points were selected, followed by addresses within those points. The sampling frame for the sampling points included all output areas (the smallest geographical unit used in census statistics) in Great Britain. This stage of sampling was disproportionate, over-sampling groups with higher and under-sampling groups with lower socio-economic status. Post-stratification weights were applied in some analyses to correct these imbalances and align the sample with target population distributions. Addresses were selected from the Postal Address File (PAF), and up to two household members aged 15 or over were invited to participate.

2.3 Fieldwork

Historically conducted as a face-to-face survey, PAMCo adopted an online-first, mixed-mode approach in 2020, offering respondents three modes: online self-completion, paper self-

completion, and CAPI. Recruitment was conducted in two stages. It started with invitation letters sent to sampled addresses, inviting up to any two household members aged 15 or over to complete an online questionnaire. There were three mailings in total: an invitation letter and two reminder letters. Paper questionnaires were sent to all non-respondents with the third mailing (second reminder), although participants could request paper copies at any time by contacting the agency. We refer to this as the *initial recruitment stage*.

The second stage was a *non-response follow-up* stage*,* during which interviewers visited non-responding households to encourage survey completion. There were three possible outcomes from this visit. First, if contact was made with a household member aged 15 or over, they could complete the survey on the spot via a CAPI. Second, if this option was declined, participants were encouraged (*nudged*) to respond online or via paper questionnaire at a later date. Paper questionnaires were offered at this stage if preferred over online completion. This phase of the recruitment aligns with the KtN strategy, where interviewers visit non-responsive households ("knock") to encourage ("nudge") participation in a self-completion mode later. A minimum of three call attempts was recommended during the non-response follow-up stage for each address. Interviewers were encouraged to make as many calls as possible, varying them by time of day and day of the week. During this stage, up to two household members aged 15 or over were selected by the field interviewers using a Kish grid. Figure 1 demonstrates the survey fieldwork flow chart:

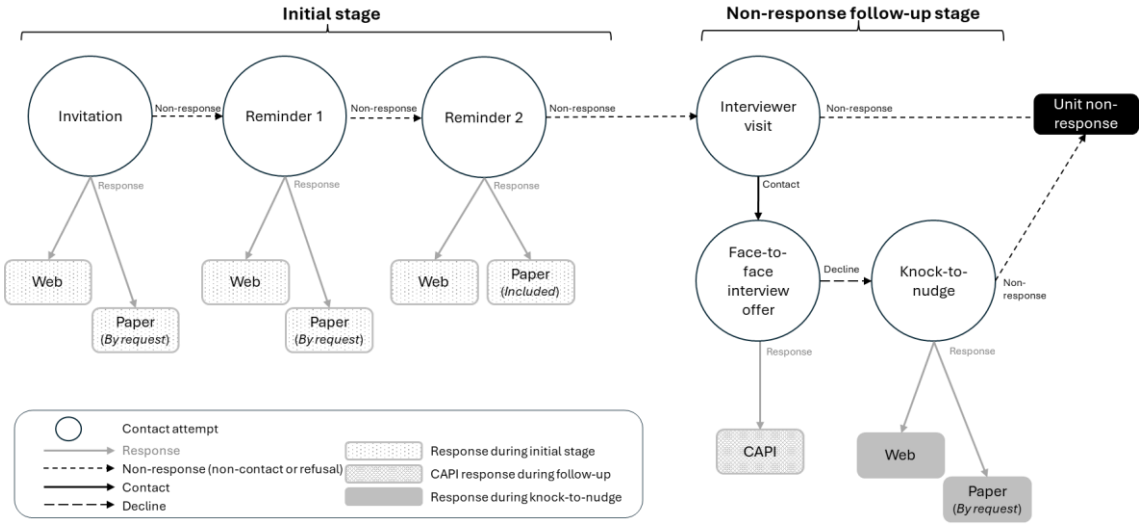


Figure 1. PAMCO survey fieldwork design

The online survey was device-agnostic, while the paper questionnaire included nearly all survey content, excluding certain questions about newspaper sections and supplements.

3 Research questions

Little is currently known about the KtN approach, as it is still relatively new. The PAMCo survey provides a unique opportunity to evaluate the effectiveness of this innovative recruitment strategy within the context of household mixed-mode surveys. In this study, we analyse PAMCo data to address the following four research questions:

RQ1: Does the knock-to-nudge stage in recruitment helps improve response rates?

We assess the extent of any increase in response rates and determine how much of this can be attributed specifically to the KtN phase. To address this research question, we propose the following hypothesis:

H1: The implementation of the KtN phase has a positive impact on the overall response rate.

RQ2: Does the knock-to-nudge stage help improve sample composition?

We hypothesise that the KtN approach not only encourages participation among individuals, who require only a minor "nudge" to respond, but also engages those typically under-represented in surveys - such as young people, respondents with lower education, and other groups often associated with higher non-response rates.

We expect that interviewers can successfully encourage reluctant participants to take part. Specifically, we anticipate that the distributions of key sociodemographic variables (including sex, age, household size, and socio-economic status) will be more closely align with population benchmarks for the full sample (i.e., initial recruitment stage + non-response follow-up stage, comprising face-to-face interviewing and KtN) than in the initial recruitment sample alone.

H2: The KtN stage recruits a higher proportion of individuals from lower socio-demographic backgrounds, lower education attainment, and ethnic minority groups, compared to both the initial recruitment and the face-to-face (CAPI) stages.

The inclusion of CAPI in mixed-mode surveys has been shown to improve the representation of certain population subgroups that are otherwise under-represented, including young people, immigrants, and urban residents (de Leeuw 2005; Buelens and van den Brakel 2010). While the KtN stage may assist in recruiting these groups, it still relies on the same response modes (web and paper questionnaires) as in the initial recruitment phase. As a result, the barriers faced by these groups in completing self-administered surveys may persist. Therefore:

H3: The CAPI phase contributes more significantly to improving sample composition than the KtN phase.

RQ3: Do participants recruited via knock-to-nudge provide data of comparable quality to those recruited at the initial stage?

While increasing survey participation across all groups is desirable, recruiting initially reluctant respondents may come at a cost to data quality. In this survey, two design elements may influence item non-response: the mode of administration and the stage of recruitment.

Although findings in the literature are mixed, the general consensus is that item non-response tends to be higher in self-administered modes (e.g., online or paper) than in interviewer-administered surveys (e.g., face-to-face). The difference is typically attributed to the absence of an interviewer overseeing the response process (Tourangeau 2000; Heerwegh and Loosveldt 2008), a finding confirmed in multiple mode comparison studies (Jäckle, Lynn, and Burton 2015; Meitinger and Johnson 2020; Cernat and Revilla 2021; Cernat et al. 2022; Klíma, Lakomý, and Volevach 2024).

However, some studies report the opposite, particularly in concurrent mixed-mode designs (Díaz de Rada 2022) or when sensitive questions are asked, where web surveys may result in significantly lower item non-response than interviewer-administered modes. Reflecting this

variation, a recent systematic review and meta-analysis by Čehovin, Bosnjak, and Lozar Manfreda (2023) found no significant differences in item non-response between web surveys and to face-to-face interviews. Comparisons involving paper surveys are less common, though some studies suggest that paper-based surveys may yield higher item non-response than both telephone and web modes (Lesser, Newton, and Yang 2012; Čehovin, Bosnjak, and Lozar Manfreda 2023).

There is also a limited evidence about the effect of non-response follow-up efforts on data quality. The literature review by Olson (2013) found a positive correlation between item non-response and recruitment effort: respondents who are recruited after multiple follow-up attempts, including converted refusals, tend to have higher item non-response rates than those who were easier to recruit.

We hypothesise that item non-response varies significantly by both survey recruitment stage and mode. Specifically, we expect CAPI respondents to show lower item non-response compared to those responding via self-administered modes. Additionally, we expect higher item non-response among those recruited during the non-response follow-up stage (i.e., KtN) compared to the initial recruitment stage. Accordingly, we formulate the following hypotheses:

H4: Participants recruited during the KtN stage have higher item non-response rates than those recruited during the initial recruitment stage or the CAPI phase.

H5: Participants responding via CAPI have lower item non-response than those responding via self-administered modes, including during the KtN stage.

RQ4: Do participants recruited via knock-to-nudge differ from those recruited during the initial stage in their readership habits?

The substantive focus of the PAMCo survey is on magazine and newspaper readership frequencies and habits, which are known to be closely associated with respondents' socio-economic characteristics (van der Wurff 2011; Hovden and Rosenlund 2021). Since the KtN stage is expected to recruit a higher proportion of individuals from lower socio-economic and educational backgrounds, we anticipate that these participants will report reading no or fewer media outlets and have lower reading frequencies compared to those recruited during the initial stage or the CAPI phase. Accordingly, we formulate the following hypothesis:

H6: Participants recruited during the KtN stage have higher proportion of non-readers compared to those recruited during the initial recruitment and CAPI stages.

4 Methodology

4.1 Response rates (RQ1)

In the PAMCo survey, reported response rates are calculated in line with the AAPOR Response Rate 5 definition (AAPOR 2023) at the household level. The approach includes only completed interviews in the numerator and exclude ineligible addresses from the denominator.

Address eligibility is assessed directly by field interviewers during the non-response follow-up stage. The reported response rate assumes there are no cases of unknown eligibility in the issued sample.

To address our first research question, we compare response rates across the following groups: (1) the initial recruitment stage, (2) the non-response follow-up stage, which includes both CAPI and KtN, and (3) the full sample, disaggregated into the initial recruitment, CAPI and KtN phases.

4.2 Sample composition (RQ2)

To analyse sample composition across survey stages, we compare distributions of socio-economic variables in the sample against high-quality population benchmarks for the target population (adults aged 15 years or over residing in households in Great Britain). Benchmarks are sourced from the 2021 Census for England and Wales (Office for National Statistics 2021), and the 2022 Census for Scotland (National Records of Scotland 2022).

We evaluate the following variables: sex, age, cross-classified sex and age, educational level, ethnicity, geographic region, disability status, household size, and housing tenure. In addition, we assess the distribution of Acorn classifications for households in the sample. Acorn is a geo-demographic segmentation tool widely used in marketing, provided by CACI Limited (2023). Unlike Census-based classification, Acorn segments UK postcodes into 63 labelled groups based on data from multiple sources, and later aggregates them into seven broader categories, which can be broadly described as: affluent achievers, rising prosperity, comfortable communities, financially stretched, urban adversity, not private households, and unclassified. Population-level Acorn distributions were taken from the 2022 recent Acorn report (CACI Limited 2023).

Our comparisons are based on three sub-samples, reflecting the fieldwork design illustrated in Figure 1:

- Sub-sample A: Initial recruitment stage only
- Sub-sample B: Initial stage plus non-response follow-up stage (CAPI-only)
- Full sample: All stages, including KtN.

We begin by comparing the unweighted distributions of each variable in Sub-sample A, B, and the full sample against the population benchmarks. Confidence intervals are calculated to assess whether each sample proportion differs significantly from the population benchmark.

To evaluate representativeness more systematically, we calculate a *dissimilarity index* for each variable, based on the method developed by Duncan and Duncan (1955). This index quantifies the proportion of respondents that would need to be reallocated across categories of a given variable to match the population distribution. The dissimilarity index DS_i for variable i, which has been divided into M categories, is defined as:

$$DS_i = \frac{1}{2} \cdot \sum_{m=1}^{M} |p_{im} - P_{im}|,$$

where p_{im} is the proportion of respondents in category m of variable i in the sample, and P_{im} is the corresponding proportion in the target population. A lower dissimilarity index in Sub-sample B, compared to Sub-sample A, suggests that adding CAPI respondents improve representativeness. A further reduction in the index in the full sample, compared to Sub-

sample B, indicates that including KtN respondents further enhances representativeness. This approach enables us to assess the relative contribution of each survey stage to improving alignment between the sample and the target population.

4.3 Item non-response (RQ3)

To assess item non-response in the PAMCo survey, we begin by reviewing the questionnaire and identifying suitable questions for analysis. Over 85% of the survey questions focus on respondents' engagement with online and printed publications. Participants are presented with a predefined list of 32 newspapers and 96 magazines.

Initially, participants are asked whether they have read or looked at the listed publications in the past twelve months. If they answer "yes", two follow-up questions are asked: one regarding the last time they read the publication, and another about how frequently they read it, either in print or digitally. An absence of a response to the initial question is typically interpreted as non-engagement with the publication. However, it may also indicate that the participant had read the publication but did not report it in the paper questionnaire context. As we are unable to reliably distinguish between true non-engagement and item non-response for these questions in paper questionnaire, they are excluded from the item non-response analysis.

Instead, we focus on the remaining survey questions - particularly those for which item non-response status can be meaningfully compared across survey modes. We identified 33 questions related to socio-demographic characteristics and behavioural indicators for inclusion in the item non-response analysis. The complete list of questions is provided in Table A2 in the Appendix.

Due to inconsistencies in coding across the survey, we were unable to distinguish between "don't know" and "refusal" responses. Additionally, several of the selected questions were not asked of all participants (i.e., they were filter questions), meaning that the number of applicable questions varied across individuals. To account for this, we calculated an individual item non-response rate (I_j) for each respondent, defined as the proportion of unanswered questions relative to the total number of questions they were eligible to answer among the questions analysed. The rate is calculated as follows:

$$I_j = \frac{NR_j}{(T - U_j)},$$

where NR_j is the total number of unanswered questions for individual j, T is the total number of questions included in the analysis (33), and U_j is the number of non-applicable questions for individual j.

We evaluate item non-response by plotting the distribution of the I_j indicator, calculating descriptive statistics (mean, median, and 95% confidence intervals), comparing non-response rates across survey stages and response modes at the question level. This analysis allows us to assess whether data quality – measured through item non-response – varies depending on the recruitment stage and mode of completion.

4.4 Substantive outcomes: Readership indicators (RQ4)

Substantive survey results are summarised using two main indicators: *Average Issue Readership* (AIR) and *Readership in the Past Year* (RPY). RPY captures the total number of

publications (titles) read over the past year. AIR measures the average number of the most recent issues of a newspaper or a magazine read by a respondent (e.g., a daily newspaper read yesterday or a monthly magazine read during the last month). By definition, RPY values are higher than AIR, as they reflect cumulative readership across a longer timeframe. These indicators are reported separately for each publication as well as in aggregate form (i.e., gross total) across all publications.

To explore whether different recruitment methods yield samples with differing readership levels, we compare the gross totals for both AIR and RPY across survey stages and response modes. As both indicators are continuous variables, we compute their means and 95% confidence intervals to evaluate statistical differences across groups.

To further assess whether these differences remain after controlling for socio-demographic characteristics, we fit four multinomial logistic regression models - two for each indicator (AIR and RPY), separately for magazines and newspapers.

For the regression analysis, we categorise each indicator as follows:

- AIR (Average Issue Readership):
  - 1 – Non-readers (no publications read)
  - 2 – Light readers (one or two publications read)
  - 3 – Moderate/heavy readers (three or more publications read).

- RPY (Readership in the Past Year):
  - 1 – Non-readers
  - 2 – Light readers
  - 3 – Moderate/heavy readers.

The general form of the multinomial logistic regression model is (Agresti 2013):

$$\log\frac{\pi_j(\boldsymbol{x})}{\pi_1(\boldsymbol{x})} = \alpha_j + \boldsymbol{\beta}_j^T\boldsymbol{x}, \qquad j = 2,3,$$

where $\pi_j(\boldsymbol{x}) = P(Y = j|\boldsymbol{x})$ is the probability that the outcome variable (AIR or RPY) takes the value *j* given a fixed set of covariates $\boldsymbol{x}$. The reference category $\pi_1(\boldsymbol{x})$ corresponds to non-readers. The model estimates coefficients α_j and $\boldsymbol{\beta_j}$, for each category $j = 2,3$.

The explanatory variables include recruitment stage, response mode, and a set of socio-demographic characteristics known to be associated with readership patterns, including sex, age group, education level, urban/rural location, and socio-economic status (Elvestad and Blekesaune 2008; Thurman and Fletcher 2017; Buturoiu, Corbu, and Boțan 2023).

We fit the models on an analytical sample, a subset of the full sample ($n = 22{,}684$), which excludes respondents with missing values for sex and ethnicity (3.8% of the total). For other independent variables with missing values, we include a separate “missing” category to avoid loss of information.

All models are estimated using the *survey* package in R (Lumley 2024), incorporating post-stratification weights and design-based clustering. This ensures that estimates account for the complex survey design and produce unbiased variances and correct inferences.

5 Results

The full 2022 PAMCo sample consists of 23,573 respondents, 62.9% of whom completed the survey online - either during the initial recruitment stage or the non-response follow-up stage. A further 20.1% participated via CAPI, and 16.9% responded using paper questionnaires. Overall, 48.1% of participants completed the survey during the initial stage (either online or via paper questionnaire), while the KtN stage accounts for 31.7% of respondents in the final sample. Table 1 summarises the sample composition across several socio-demographic variables by survey stage and administration mode, comparing these distributions with those in the full sample.

Table 1. Unweighted sample characteristics (in percentages) by survey recruitment stages and survey modes

Variable	Category	Initial stage		Non-response follow-up			Full sample
		Online	Paper	CAPI	KtN online	KtN paper	
Sex	Female	52.5	57.7	53.3	54.0	56.2	**53.7**
	Male	44.8	41.1	46.6	43.2	41.2	**44.2**
	Other	2.7	1.2	0.1	2.9	2.7	**2.1**
Age	15-29	19.5	4.1	13.4	23.7	7.6	**17.0**
	30-39	19.7	6.1	13.1	18.9	12.6	**16.4**
	40-49	17.7	7.6	13.3	18.1	12.0	**15.6**
	50-59	17.3	16.6	15.0	17.9	15.7	**16.7**
	60-69	15.0	25.6	16.1	12.2	18.9	**15.8**
	70+	10.9	39.9	29.0	9.2	33.1	**18.5**
Education	No qualifications	4.6	13.5	15.4	6.3	22.4	**9.5**
	Non-degree level	41.3	50.4	46.3	44.4	47.1	**44.3**
	Degree level	47.8	34.9	26.9	38.1	26.7	**38.5**
	Missing	6.3	1.2	11.4	11.1	3.8	**7.8**
Ethnicity	White	87.6	92.8	85.3	83.9	85.0	**86.5**
	Other	10.0	4.8	14.2	12.2	11.5	**11.1**
	Missing	2.4	2.4	0.4	3.9	3.5	**2.4**
UK Region	North East	3.7	3.4	2.8	4.7	1.5	**3.5**
	North West	9.6	9.5	11.7	6.9	22.8	**10.6**
	Yorkshire and the Humber	7.3	7.3	7.4	8.9	6.1	**7.6**
	West Midlands	8.2	7.9	2.7	8.7	11.6	**7.5**
	East Midlands	8.3	7.2	5.5	5.9	5.6	**6.9**
	East of England	9.2	9.0	15.2	7.4	4.3	**9.5**
	South West	8.9	11.7	9.6	10.2	4.4	**9.2**
	South East	14.4	15.3	8.1	14.4	9.8	**12.8**
	Greater London	14.7	11.3	18.0	16.7	15.0	**15.6**
	Wales	4.0	5.0	2.8	3.3	7.0	**3.9**
	Scotland	11.6	12.5	16.2	12.8	11.8	**12.9**
Participant disability	Yes	11.9	20.3	15.9	10.6	18.9	**13.7**
	No	81.7	70.4	82.6	79.7	64.1	**78.9**
	Missing	6.5	9.3	1.5	9.7	17	**7.4**
Persons per HH size	1	12.8	32.1	32.8	13.9	28.9	**20.0**
	2	43.0	44.5	34.3	33.4	38.4	**38.8**
	3	18.0	11.1	13.0	19.1	12.3	**16.2**
	4	17.8	8.0	12.4	21.6	12.7	**16.3**
	5+	8.4	4.3	7.6	12.0	7.7	**8.7**
Acorn group	Affluent achievers	34.7	37.3	25.2	31.0	28.7	**31.6**
	Rising prosperity	13.1	7.6	8.7	12.9	6.0	**11.1**
	Comfortable communities	26.3	29.2	31.2	26.0	27.7	**27.6**
	Financially stretched	15.8	16.4	20.2	18.3	23.4	**18.0**
	Urban adversity	9.6	9.0	14.3	11.3	13.9	**11.3**
	Not private households / Unclassified	0.6	0.5	0.4	0.5	0.4	**0.5**

Tenure	Owned outright	32.6	61.3	45.4	26.1	41.7	**36.8**
	Owned with mortgage/loan	35.0	18.5	18.1	31.9	20.7	**28.3**
	Rented from council	6.4	7.9	14.2	7.9	14.9	**9.2**
	Rented from someone else	16.7	9.9	19.6	19.2	16.4	**17.3**
	Rent free	1.1	1.0	0.6	1.1	1.3	**1.0**
	Missing	8.3	1.4	2.1	13.7	5.0	**7.4**
Proportion of respondents by mode and stage		**40.1**	**8.0**	**20.1**	**22.8**	**8.9**	**100.0**

5.1 Response rates (RQ1)

The 2022 PAMCo sample includes responses from 19,257 households, with an average of 1.22 respondents per household. Given that the issued eligible sample consisted of 50,732 addresses, the achieved AAPOR5 response rate – calculated based on eligible addresses and including partially complete interviews - is 38.0%. Table 2 summarises the sample sizes in terms of complete households and individual interviews, along with household-level response rates by recruitment stage and for the overall sample.

Table 2. Sample sizes and response rates by recruitment stage

Indicator	Initial recruitment stage	Non-response follow-up stage		Total
		CAPI	KtN	
Number of responding households	8,306	4,437	6,514	19,257
Response rate (household level, %)	16.4	8.7	12.8	38.0
Number of individual interviews	11,342	4,744	7,487	23,573
Mean number of interviews per household	1.36	1.06	1.15	1.22

Consistent with H1, the non-response follow-up stage substantially improves overall survey response rates. The initial response rate of 16.4% rises to 38.0% in the full sample, which includes both CAPI and KtN respondents. The largest contribution to this increase comes from the KtN stage, accounting for 31.7% of the full sample, compared to 20.1% for CAPI respondents.

5.2 Sample composition and representativeness (RQ2)

Table 3 presents unweighted sample composition analysis and allows comparisons with population benchmarks. The results support H2, indicating that the non-response follow-up stage improves sample composition. Specifically, for age, the table demonstrates that the non-response follow-up stages significantly increased participation among those aged 70 or over. While the CAPI phase initially raised the dissimilarity index (from 5.9% in Subsample A to 6.6% in Subsample B), the KtN phase led to a notable improvement, reducing it to 5.1% in the full sample.

A similar pattern is observed for education, with a higher representation of participants with no qualifications following the KtN stage (dissimilarity index reduced from 10.1% to 9.4%). For ethnicity, both non-response follow-up phases improved the representativeness of ethnic minorities, with CAPI providing the most substantial reduction in the dissimilarity index from 6.3% to 4.8%, and the KtN stage further reducing it to 4.3%.

The proportion of participants with a disability is also increased in both follow-up phases, with CAPI having a greater effect (reducing the dissimilarity index from 6.3% to 5.7%). The KtN stage

was particularly effective in increasing participation among one-person households and renters, for which CAPI had little to no impact on representativeness.

In contrast, the distribution of Acorn groups improved more substantially during the CAPI stage. This stage reduced the over-representation of wealthier groups (affluent achievers and rising prosperity), and increased participation from households classified as urban adversity, lowering the dissimilarity index from 14.5% in Subsample A to 11.3% in Subsample B. The KtN stage provided an additional improvement, reducing the index further to 10.1%.

Table 3. Unweighted sample composition and representativeness

Variable	Category	Sample composition (%)				Unweighted Sample size	Dissimilarity index (%)		
		Subsample A	Subsample B	Full Sample	Targets		Subsample A	Subsample B	Full Sample
Sex	Female	54.7***	54.3***	54.9***	51.6	23,085	3.2	2.8	3.3
	Male	45.3***	45.7***	45.1***	48.4				
Age	15-29	17.0***	15.9***	17.0***	22.1	23,573	5.9	6.6	5.1
	30-39	17.4**	16.1	16.4	16.4				
	40-49	16.0*	15.2	15.6	15.2				
	50-59	17.1	16.5	16.7	16.6				
	60-69	16.7***	16.6***	15.8***	13.2				
	70+	15.8*	19.7***	18.5***	16.5				
Age * Sex	Female * 15-29	9.7***	8.9***	9.4***	11.0	23,085	9.1	9.1	7.9
	Female * 30-39	10.0***	9.2***	9.6***	8.5				
	Female * 40-49	9.1***	8.6***	8.9***	7.8				
	Female * 50-59	9.7***	9.1**	9.2***	8.5				
	Female * 60-69	8.7***	8.6***	8.3***	6.7				
	Female * 70+	7.4***	10.0***	9.5*	9.1				
	Male * 15-29	6.7***	6.7***	7.2***	11.0				
	Male * 30-39	7.3**	6.8***	6.8***	7.9				
	Male * 40-49	6.9**	6.6***	6.7***	7.5				
	Male * 50-59	7.6*	7.5**	7.6**	8.2				
	Male * 60-69	8.3***	8.1***	7.6***	6.4				
	Male * 70+	8.5***	9.9***	9.2***	7.4				
Education	No qualifications	6.4***	9.5***	10.3***	19.6	21,737	10.1	11.1	9.4
	Non degree level	45.3***	47.3***	48.0***	43.7				
	Degree and above	48.3***	43.2***	41.7***	36.6				
Ethnicity	White	90.6***	89.1***	88.6***	84.4	22,999	6.3	4.8	4.3
	Other	9.4***	10.9***	11.4***	15.6				
UK Region	North East	3.7**	3.4***	3.5***	4.1	23,573	5.3	8.2	6.8
	North West	9.6***	10.2***	10.6***	11.4				
	Yorkshire & Humber	7.3***	7.3***	7.6***	8.4				
	West Midlands	8.2***	6.6***	7.5***	9.0				
	East Midlands	8.1*	7.3	6.9***	7.5				
	East of England	9.2*	10.9***	9.5	9.7				
	South West	9.3	9.4*	9.2	8.9				
	South East	14.6	12.7***	12.8***	14.2				
	Greater London	14.1**	15.3***	15.6***	13.4				
	Wales	4.2***	3.8***	3.9***	4.8				
	Scotland	11.8***	13.1***	12.9***	8.6				
Participant disability	Yes	14.3***	14.8***	14.8***	20.5	21,831	6.3	5.7	5.8
	No	85.7***	85.2***	85.2***	79.5				
Persons per HH size	1	16.0	20.9***	20.0***	13.0	23,573	9.1	11.1	8.3
	2	43.3***	40.6***	38.8***	28.7				
	3	16.8***	15.7***	16.2***	19.9				
	4	16.2***	15.1***	16.3***	21.3				
	5+	7.7***	7.7***	8.7***	17.2				

Acorn group	Affluent achievers	35.2***	32.2***	31.6***	23.7	23,573	14.5	11.3	10.1
	Rising prosperity	12.2***	11.2***	11.1***	9.6				
	Comfortable communities	26.8	28.1*	27.6	27.3				
	Financially stretched	15.9***	17.2***	18.0***	22.9				
	Urban adversity	9.5***	10.9***	11.3***	16.4				
	Not private households / Unclassified	0.5***	0.5***	0.5***	0.1				
Housing tenure	Owned outright	40.3***	42.1***	39.8***	32.0	21,822	9.6	11.0	9.1
	Owned with mortgage/loan	34.7**	29.8***	30.6***	33.4				
	Rented from council	7.1***	9.4***	9.9***	8.6				
	Rented from someone else	16.7***	17.7***	18.7***	24.0				
	Rent free	1.1***	1.0***	1.1***	2.0				
Mean dissimilarity index for sample							**8.2**	**8.0**	**7.0**

Note: The table compares, for each variable and survey administration mode, the unweighted proportion of respondents in each category, with the proportion of respondents in each category for the full sample. We use a Z-test for comparing proportions. Significance levels: * - $p < 0.05$, ** - $p < 0.01$, *** - $p < 0.001$.

It should be noted that the non-response follow-up stage did not improve representativeness for the unweighted distributions of sex or UK region. Among the eight variables for which the dissimilarity index improved (age, age*sex, education, ethnicity, disability, HH size, Acorn group, tenue), five demonstrated their most substantial gains following the KtN stage rather than CAPI (age, age*sex, education, HH size, tenure). Only three variables - ethnicity, disability, and Acorn group - demonstrated greater improvement during the CAPI. This pattern is also reflected in the mean dissimilarity index, which decreased only marginally from 8.2% in Subsample A to 8.0% in Subsample B, but dropped more substantially to 7.0% in the full sample following the KtN stage. These results suggest that, contrary to H3, the main improvements in unweighted sample representativeness were achieved during the KtN stage rather than during CAPI.

We also conducted an analysis using the weighted sample, with results presented in Table A1 in the Appendix. The findings provide further support for H2. However, as expected the improvements in sample composition are more pronounced in the unweighted sample. In the weighted analysis, some variables not included in the weighting process (e.g. disability and housing tenure) show reduced representativeness after the non-response follow-up stages.

5.3 Item non-response (RQ3)

Figure 2 illustrates the distribution of the item non-response indicator I_j for the full sample, disaggregated by survey stage: initial recruitment, CAPI, and KtN. The distribution is highly skewed, with 80% of the sample having no item non-response, and fewer than 5% showing an item non-response rate of 30% or higher. Among the three stages, the CAPI sample has the highest proportion of respondents with no item non-response (86.7%), followed by the initial recruitment sample (79.7%), and the KtN sample (69.0%).

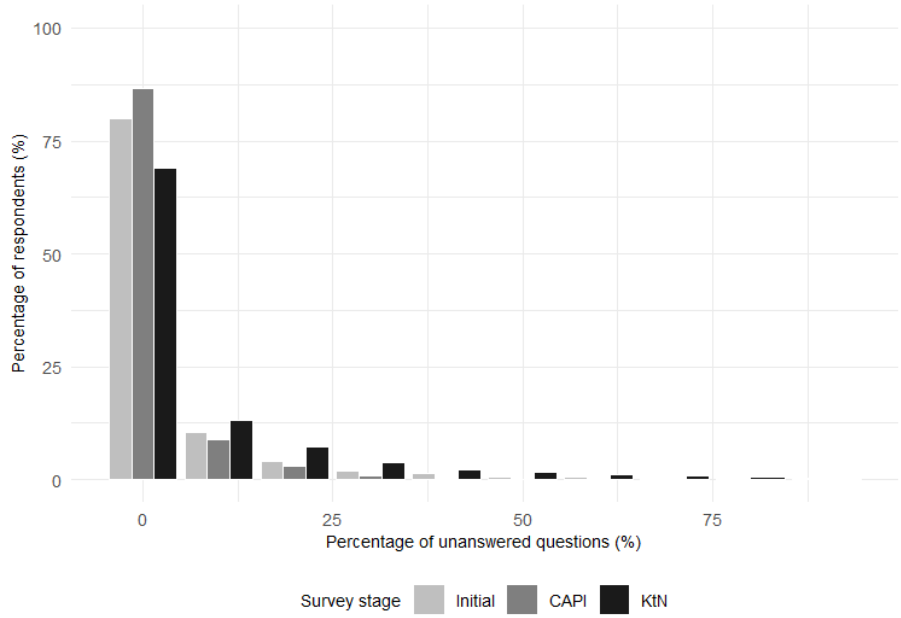


Figure 2. Distribution of item non-response in the sample

Figure 3 presents item non-response rates by question, organised according to their order in the questionnaire and survey stage. As hypothesised (H4), item non-response is generally higher among respondents recruited during the KtN stage compared to those recruited in the initial stage or via CAPI. The highest item non-response rates are observed for Questions 4 and 25 in the socio-demographic section. These items represent the educational qualifications and employment status of the household's chief income earner, who may not be the respondent. Among KtN respondents, these questions have item non-response rates of 20.7% and 14.5%, respectively. For CAPI, the highest non-response is found in the highest qualification question (11.3%), and in a behavioural question about business air travel (13.3%).

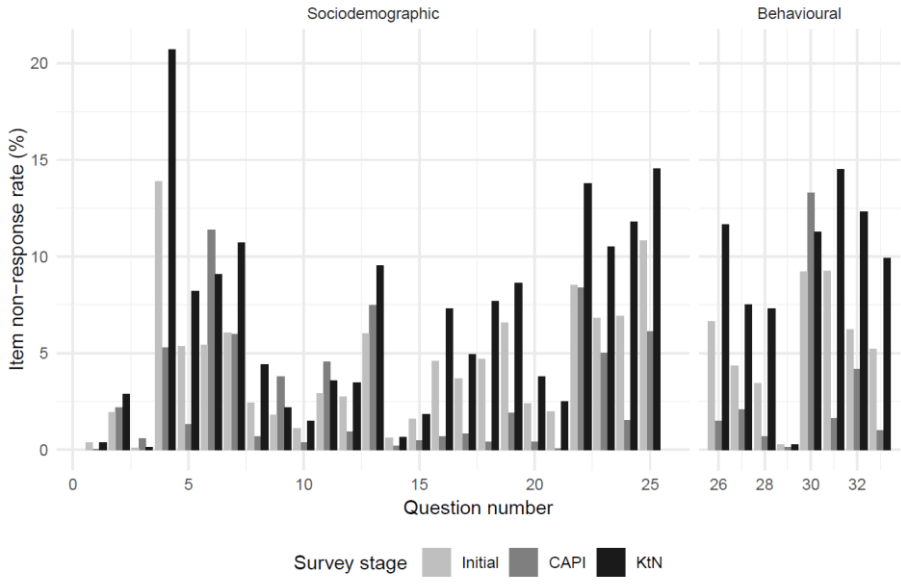


Figure 3. Item non-response rates across questions

Table 4 presents the mean item non-response rates across different stages and response modes. Given the positively skewed distributions of item-nonresponse, the mean is not the most appropriate measure of central tendency. However, it is reported here for comparative purposes, as the distributions are similarly skewed across stages. This allows for meaningful comparisons and adds an additional dimension to understanding item non-response patterns.

Table 4. Mean item non-response by survey stage and mode

Survey stage	Mode	Mean number of questions	Mean item non-response (%)
Initial	Online	31.4	7.0 [6.8, 7.1]
	Paper	31.6	6.2 [6.0, 6.3]
Non-response follow-up	CAPI	32.0	4.1 [4.0, 4.2]
	KtN Online	30.7	10.5 [10.3, 10.8]
	KtN Paper	30.5	11.2 [11.0, 11.4]

Note: % item non-response provides the mean of the percentage of unanswered items for each survey stage, mode, and type of question, for all 33 questions. Values in brackets are the lower and upper limits of the 95% confidence interval of this mean value.

As hypothesised (H5), CAPI respondents have the lowest levels of item non-response, with a mean rate of 4.1%. Supporting H4, respondents recruited during the initial stage - whether completing the survey online or on paper - show lower item non-response rates than those recruited during the KtN stage. Consistent with prior research, the highest item non-response is observed among paper respondents recruited during the KtN, with a mean rate of 11.2%. Interestingly, this pattern reverses in the initial recruitment stage, where online respondents have a higher mean item non-response (7.0%) than their paper counterparts (6.2%).

5.4 Substantive variables (RQ4)

Table 5 summarises the two outcome variables (AIR and RPY indicators) used for the analysis. Non-readers represent the largest groups for both newspapers and magazines across both indicators, whereas moderate and heavy readers represent the smallest groups.

Table 5. Distributions of the AIR and RPY indicators

Indicator	Category	Newspapers (%)	Magazines (%)
AIR	Non-reader	77.8	60.4
	Light reader	19.1	28.7
	Moderate/heavy reader	3.1	11.0
RPY	Non-reader	51.8	40.3
	Light reader	37.1	34.8
	Moderate/heavy reader	11.1	24.9

Table 6 presents the mean values of the AIR and RPY indicators, disaggregated by survey stage and response mode. As hypothesised (H6), respondents recruited during the initial recruitment stage generally report higher level of readership, particular in the RPY indicator. This pattern is particularly evident among initial stage respondents in both modes, who show significantly higher RPY values across both response modes compared to KtN respondents.

While differences across stages are also observed in the AIR indicator, they are smaller in magnitude. Notably, there are no significant differences in AIR values for newspapers and magazines between online respondents recruited during the initial and KtN stages. Similarly, AIR for CAPI respondents are not significantly different from those of online respondents recruited during either the initial or KtN stage.

Table 6. Average issue readership (AIR) and Read in the past year (RPY) indicators per survey stage and mode

Survey stage	Mode	Average issue readership (AIR)		Read in the past year (RPY)	
		Newspapers	Magazines	Newspapers	Magazines
Initial	Online	0.37 [0.35, 0.39]	1.10 [1.05, 1.14]	1.49 [1.44, 1.54]	3.46 [3.36, 3.56]
	Paper	0.68 [0.62, 0.73]	1.18 [1.06, 1.30]	1.60 [1.52, 1.69]	2.58 [2.40, 2.76]
Non-response follow up	CAPI	0.34 [0.32, 0.36]	0.53 [0.49, 0.56]	0.83 [0.79, 0.87]	1.20 [1.13, 1.27]
	KtN Online	0.33 [0.31, 0.36]	0.99 [0.92, 1.06]	1.28 [1.22, 1.34]	3.11 [2.97, 3.25]
	KtN Paper	0.45 [0.41, 0.49]	0.70 [0.63, 0.77]	1.14 [1.07, 1.21]	1.57 [1.43, 1.70]

Note: Values in brackets are the lower and upper limits of the 95% confidence interval of the mean values of RPY and AIR.

The results of the logistic regression models are presented in Table A3 and A4 in the Appendix. For both AIR and RPY indicators, the analysis demonstrates consistent associations between magazine and newspaper readership and both survey stage and administration mode, even after controlling for key demographic characteristics.

To synthesise the findings and provide a comprehensive overview of all outcome variables, predicted probabilities from the models are presented in Figure 4. As hypothesised (H6), the probability of recruiting non-readers is higher in the non-response follow-up stage than in the initial stage. Among online participants, the probability of being a non-reader is higher for those recruited during the KtN stage than for those recruited during the initial stage, supporting H6. A similar pattern is observed among paper respondents, with the KtN sample showing a higher probability of being non-readers compared to the paper sample from the initial recruitment stage.

Contrary to H6, although KtN-recruited participants have a higher probability of reporting being non-readers than those in the initial stage, this probability is highest in the CAPI group.

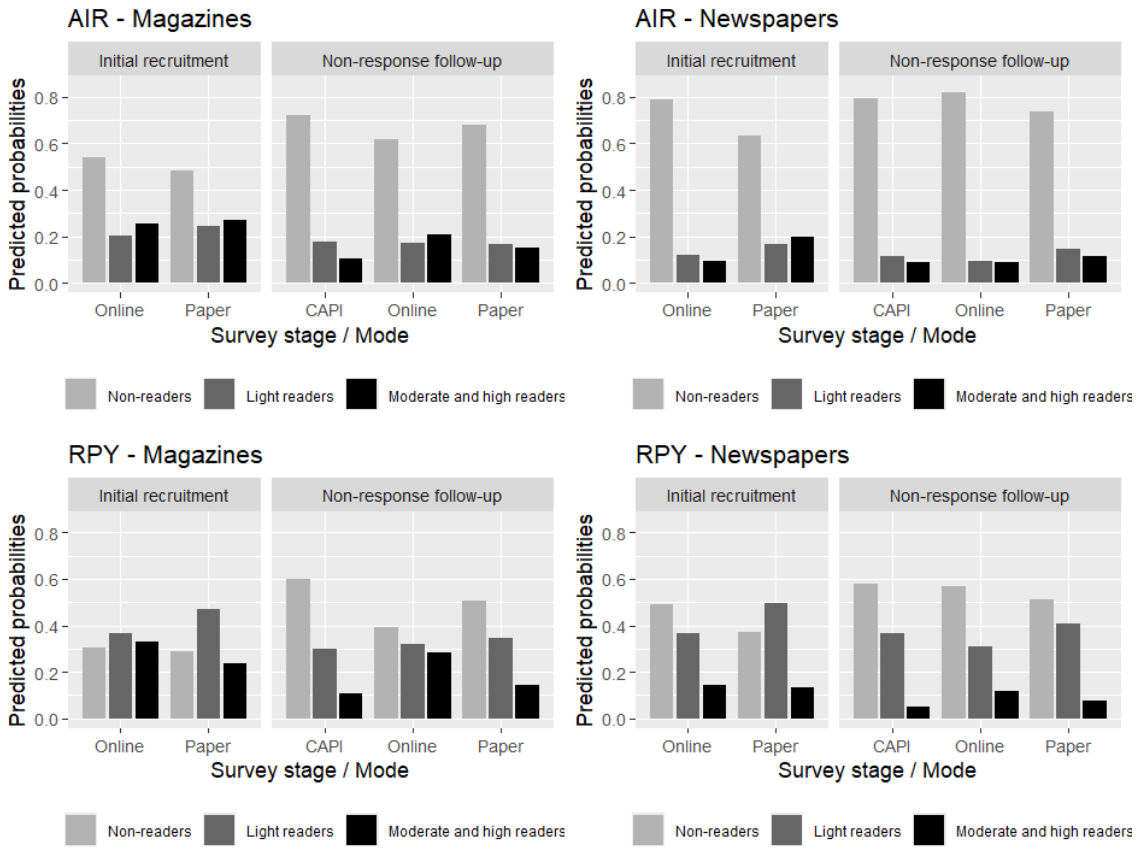


Figure 4. Predicted probability plots (top row: AIR and bottom row: RPY) per survey stage and mode for magazines (left column) and newspapers (right column)

While it is not possible to determine the true values of the substantive indicators for the target population, we expect the final sample to better reflect magazine and newspaper readership and consumption habits. This expectation is based on the established association between these substantive variables and the socio-demographic characteristics of the target population, as well as the improved representativeness achieved by including higher proportions of the respondents from the under-represented groups during the non-response follow-up stage. Therefore, the non-response follow-up stage – including the KtN approach – is essential for the PAMCo survey to fulfil its objective of accurately understanding media consumption and quantifying media reach and habits within the target population.

6 Discussion

As high-quality probability-based surveys increasingly shift towards self-administration, recruitment practices must innovate to ensure that high response rates and representative samples remain achievable. Originally developed to improve survey participation during the COVID-19 restrictions in the UK, the knock-to-nudge (KtN) method offers a compelling approach to engage survey participants by having field interviewers visit households and encourage (nudge) them to complete the survey later via online, paper or telephone mode. This interviewer-participant interaction proved successful in boosting response rates for

multiple surveys during the COVID-19 pandemic, leading several UK studies to continue using KtN even after restrictions were lifted.

The PAMCo survey incorporates KtN as a key component of its recruitment strategy, requiring field interviewers to visit all non-responding households after the initial recruitment stage. PAMCo introduces an important innovation: rather than simply nudging respondents towards online or paper self-completion, interviewers first offer the option of completing the survey via CAPI. Only if they declined are respondents encouraged to use the self-administered modes.

Our analysis indicates that offering multiple participation options significantly benefits the PAMCo survey. The non-response follow-up stage substantially improved survey participation, with the initial response rate of 16.4% rising to a final rate of 38.0%, including both CAPI and KtN respondents, with KtN having 12.8% response rate. Given that 48.1% of participants responded during the initial stage, the non-response follow-up stage contributed with more than half of the final sample. Notably, KtN accounted for 31.7% of responses, while CAPI interviews represented 20.1%. Consistent with other preliminary UK survey analyses, KtN appears to be an effective method to increase response and improve participation.

More importantly, the non-response follow-up stage also improves sample composition. In the unweighted final sample (combining the initial stage and the non-response follow-up stages (CAPI and KtN), the distribution of key socio-demographic indicators aligns more closely with population benchmarks than in the initial sample. Although both non-response follow-up stages contribute to improving sample representativeness, our unweighted results demonstrate that KtN accounts for the most substantial gains compared to CAPI. The non-response follow-up stage particularly boosts participation among traditionally harder-to-survey groups, including adults aged 70 or over, individuals without formal qualifications, ethnic minorities, single-person households, renters, and people with disabilities. These improvements result in a final sample that more accurately represents the target population.

Our findings also suggest that KtN recruits a higher proportion of disengaged or less motivated participants, as evidenced by significantly higher item non-response rates among both online and paper respondents during the non-response follow-up stage. In line with previous literature (e.g., Olson 2013), reluctant participants tend to have a higher item non-response than easier-to-recruit counterparts. Item non-response is lower for CAPI respondents, so the inclusion of the CAPI phase lowers the overall item non-response rate in the full sample. While these findings represent one of the few drawbacks of the KtN, further research is needed to fully understand its implications.

Finally, incorporating CAPI and KtN phases into the fieldwork significantly affects the substantive variables measured in the survey. The non-response follow-up stage captured higher proportions of individuals reporting no publication readership. Since newspaper and magazine readership is strongly associated with socio-demographic characteristics such as age, sex, education, and socio-economic status – and because the final sample is more representative of the target population - we expect that the final sample to provide a more diverse and accurate representation of media consumption habits. This represents an important additional benefit of implementing the non-response follow-up stage, including KtN, in the PAMCo survey.

Several methodological limitations should be noted. The design is non-experimental, therefore it allows only for the investigation of associations but not causal relationships. From

a questionnaire design perspective, there are challenges in identifying item non-response and valid responses for certain questions in the paper version of the questionnaire. For example, in the media consumption section, the current paper format cannot distinguish between participants who are aware of a publication but do not read it and those who are unaware of it. Both scenarios result in the absence of a positive response (i.e., the "Yes" box not checked), thereby conflating genuine non-readership with item non-response.

Our analysis is also limited by paradata availability. The dataset does not track the exact mailings each household receives, so it is impossible to determine precisely which recruitment effort triggered their response. While survey protocol mandates three mailings – an initial invitation followed by two reminders – before the non-response follow-up, some households may have received a reminder letter after an interviewer visit, prompting an online response that we attribute to the follow-up visit. More detailed paradata would allow refinement of this analysis. Access to call details during the KtN phase was also unavailable, which limits our ability to conduct an in-depth analysis of this phase. Additionally, we lack information on non-responding addresses in the issued sample, limiting our ability to identify population groups less likely to respond at either recruitment stage. Such information could enable response propensity modelling to allocate follow-up efforts more efficiently, thereby improving response rates and representativeness. Only one data quality indicator - item non-response – was investigated; additional indicators should be explored in different survey contexts to gain a deeper understanding of the impact of the KtN phase on data quality.

Finally, there is a clear trade-off between the benefits of an interviewer-led non-response follow-up (in terms of sample composition and response rates) and its associated fieldwork costs. While field interviewers add significantly to survey expenses, these costs may still be lower than those of full face-to-face interviews, since the KtN strategy limits interviewer involvement to brief visits encouraging participation (though in PAMCo, the CAPI option remains available). Whether non-response follow-up (including KtN) remains a cost-effective technique for mixed-mode self-administered surveys depends on whether its benefits outweigh these costs. As cost data were unavailable for this survey, a detailed cost-benefit analysis of KtN is an essential topic for future research (Coffey et al. 2024).

References

AAPOR (2023), "Standard Definitions Final Dispositions of Case Codes and Outcome Rates for Surveys," American Association for Public Opinion Research. Available at: *https://aapor.org/wp-content/uploads/2023/05/Standards-Definitions-10th-edition.pdf*.

Agresti, A. (2013), *Categorical Data Analysis* (3rd ed.), Hoboken, NJ: Wiley.

Buelens, B., and van den Brakel, J. (2010), "On the necessity to include personal interviewing in mixed-mode surveys," *Survey Practice*, 3 (5), 1-8. DOI: 10.29115/SP-2010-0023.

Buturoiu, R., Corbu, N., and Boțan, M. (2023), "Patterns of news consumption in a high-choice media environment," in Patterns of News Consumption in a High-Choice Media Environment. Springer Studies in Media and Political Communication: A Romanian Perspective, eds. R. Buturoiu, N. Corbu and M. Boțan: Springer, Cham.

CACI Limited (2023), "ACORN User Guide 2023," UK Data Service. Available at: *https://doc.ukdataservice.ac.uk/doc/9183/mrdoc/pdf/9183_acorn_user_guide_2023.pdf*.

Čehovin, G., Bosnjak, M., and Lozar Manfreda, K. (2023), "Item nonresponse in web versus other survey modes: A systematic review and meta-analysis," *Social Science Computer Review*, 4 (3), 926-945. DOI: 10.1177/08944393211056229.

Cernat, A., and Revilla, M. (2021), "Moving from face-to-face to a web panel: Impacts on measurement quality," *Journal of Survey Statistics and Methodology*, 9, 745-763. DOI: 10.1093/jssam/smaa007.

Cernat, A., Sakshaug, J. W., Christmann, P., and Gummer, T. (2022), "The impact of survey mode design and questionnaire length on measurement quality," *Sociological Methods & Research*, 53 (4), 1873-1904. DOI: 10.1177/00491241221140139.

Coffey, S., Maslovskaya, O., & McPhee, C. (2024), "Recent innovations and advances in mixed-mode surveys," *Journal of Survey Statistics and Methodology*, 12(3), 507-531. DOI: 10.1093/jssam/smae025.

Cornick, P., d'Ardenne, J., Maslovskaya, O., Mesplie-Cowan, S., Nicolaas, G., and Smith, P. (2022), "Review of options for the National Survey for Wales," GSR report number 27/2022, Cardiff: Welsh Government. Available at: *https://gov.wales/national-survey-wales-development-work#section-18671*.

de Leeuw, E. D. (2005), "To mix or not to mix data collection modes in surveys," *Journal of Official Statistics*, 21 (2), 233-255.

Díaz de Rada, V. (2022), "Concurrent mixed modes: Response quality, speed, and cost," *Field Methods*, 34 (3), 191-205. DOI: 10.1177/1525822X221105917.

Dillman, D. A. (2020), "Towards survey response rate theories that no longer pass each other like strangers in the night," in Understanding Survey Methodology: Sociological Theory and Applications, ed. P. S. Brenner, Boston, MA, USA: Springer.

Domarchi, C., Maslovskaya, O., and Smith, P. W. F. (2025), "Knock-to-nudge methods for recruitment in self-administered surveys: Evidence review," Survey Futures Report 7, at www.surveyfutures.net/reports (forthcoming).

Duncan, O. D., and Duncan, B. (1955), "A methodological analysis of segregation indexes," *American Sociological Review*, 20 (2), 210-2017. DOI: 10.2307/2088328.

Elvestad, E., and Blekesaune, A. (2008), "Newspaper readers in Europe: A multilevel study of individual and national differences," *European Journal of Communication*, 23 (4), 425-447. DOI: 10.1177/0267323108096993.

Eurostat (2020), "Data collection for the EU-Labour Force Survey in the context of the COVID-19 crisis," EUROSTAT, Directorate F, Unit F3 - Labour Market and Lifelong Learning. Available at: *https://ec.europa.eu/eurostat/documents/10186/10693286/LFS_guidance.pdf*.

Heerwegh, D., and Loosveldt, G. (2008), "Face-to-face versus web surveying in a high-internet-coverage population: Differences in response quality," *Public Opinion Quarterly*, 72 (5), 836-846. DOI: 10.1093/poq/nfn045.

Hovden, J. F., and Rosenlund, L. (2021), "Class and everyday media use: A case study from Norway," *Nordicom Review*, 42 (S3), 129-149. DOI: 10.2478/nor-2021-0030.

Ipsos (2023), "PAMCo SLA Technical Appendix 2022 Report," IPSOS Mori, PAMCo. Available at: *https://pamco.co.uk/wp-content/uploads/2024/02/PAMCo-SLA-Technical-Appendix-2022-Report.pdf*.

Jäckle, A., Lynn, P., and Burton, J. D. (2015), "Going online with a face-to-face household panel: Effects of a mixed mode design on item and unit non-response," *Survey Research Methods*, 9 (1), 57-70. DOI: 10.18148/srm/2015.v9i1.5475.

Jenkins, S., and Forbes, N. (2024), "National Survey for Wales 2022-23 and 2021-23 Combined Years Data Technical Report," Welsh Government, Office for National Statistics. Available at: *https://www.gov.wales/sites/default/files/statistics-and-research/2024-02/national-survey-for-wales-2022-23-and-2021-23-combined-years-data--technical-report.pdf*.

Kastberg, S., and Siegler, V. (2022), "Impact of COVID-19 on ONS social survey data collection," Office for National Statistics. Available at: *https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/methodologies/impactofcovid19ononssocialsurveydatacollection*

Klíma, O., Lakomý, M., and Volevach, E. (2024), "Impacts of cultural factors and mode of administration on item nonresponse for political questions in the European context," *International Journal of Social Research Methodology*, 27 (4), 389-400. DOI: 10.1080/13645579.2023.2175921.

Kunz, T., Daikeler, J., and Ackermann-Piek, D. (2024), "Interviewer-observed paradata in mixed-mode and innovative data collection," *International Journal of Market Research*, 66 (1), 14-26. DOI: 10.1177/14707853231184742.

Lesser, V., Newton, L., and Yang, D. (2012), "Comparing item nonresponse across different delivery modes in general population surveys," *Survey Practice*, 5 (2), 1-5. DOI: 10.29115/SP-2012-0009.

Luijkx, R., Jónsdóttir, G. A., Gummer, T., Stähli, M. E., Frederiksen, M., Ketola, K., Reeskens, T., Brislinger, E., Christmann, P., Gunnarsson, S. Þ., Hjaltason, Á. B., Joye, D., Lomazzi, V., Maineri, A. M., Milbert, P., Ochsner, M., Pollien, A., Sapin, M., Solanes, I., Verhoeven, S., and Wolf, C. (2021), "The European Values Study 2017: On the way to the future using mixed-modes," *European Sociological Review*, 37 (2), 330-346. DOI: 10.1093/esr/jcaa049.

Lumley, T. (2024) , "survey: analysis of complex survey samples," *Journal of Statistical Software*, 9 (8), 1-19. DOI: 10.18637/jss.v009.i08

Meitinger, K. M., and Johnson, T. P. (2020), "Power, culture, and item nonresponse in social surveys," in Understanding Survey Methodology. Frontiers in Sociology and Social Research, Vol. 4, ed. P. S. Brenner, Springer Cham.

National Records of Scotland (2022). 2022 Census [Flexible Table Builder]. Available at: *https://www.scotlandscensus.gov.uk/census-results/flexible-table-builder/*

Office for National Statistics (2021). 2021 Census [Create a custom dataset]. UK Data Service. Available at: *https://www.ons.gov.uk/datasets/create*

Olson, K. (2013), "Do non-response follow-ups improve or reduce data quality?: A review of the existing literature," *Journal of the Royal Statistical Society Series A: Statistics in Society*, 176 (1), 129-145. DOI: 10.1111/j.1467-985X.2012.01042.x.

Schober, M. F. (2018), "The future of face-to-face interviewing," *Quality Assurance in Education*, 26 (2), 290-302. DOI: 10.1108/QAE-06-2017-0033.

Siemiatkowska, M., and Gilliland, S. (2025), "Doorstep interactions to drive data: Implementing Knock-to-Nudge (KtN) alongside an Adaptive Survey Design (ASD) for the Transformed Labour Force Survey," in *European Social Survey - Survey methodology webinar series*. Available at: https://www.youtube.com/watch?v=bleifeasknc

Smith, P. (2020). The impact of Covid-19 on high quality complex general population surveys. Available at: *https://the-sra.org.uk/SRA/SRA/Blog/The%20impact%20of%20Covid19%20on%20high%20quality%20complex%20general%20population%20surveys.aspx*

--- (2022), "What is knock-to-nudge and does it have a future?," Powerpoint Presentation IPSOS. Available at: *https://www.ncrm.ac.uk/documents/4_Patten%20Smith_Data%20collection%20network%202_2_22.pdf*.

Thurman, N., and Fletcher, R. (2017), "Has digital distribution rejuvenated readership? Revisiting the age demographics of newspaper consumption," *Journailsm Studies*, 20 (4), 542-562. DOI: 10.1080/1461670X.2017.1397532.

Tourangeau, R. (2000), *The Psychology of Survey Response*, Cambrige University Press.

van der Wurff, R. (2011), "Do audiences receive diverse ideas from news media? Exposure to a variety of news media and personal characteristics as determinants of diversity as received," *European Journal of Communication*, 26 (4), 328-342. DOI: 10.1177/0267323111423377.

Wolf, C., Christmann, P., Gummer, T., Schnaudt, C., and Verhoeven, S. (2021), "Conducting general social surveys as self-administered mixed-mode surveys," *Public Opinion Quarterly*, 85 (2), 623-648. DOI: 10.1093/poq/nfab039.

Appendix

Table A1. Weighted sample composition and representativeness

Variable	Category	Sample composition (%)				Unweighted Sample size	Dissimilarity index (%)		
		Subsample A	Subsample B	Full Sample	Targets		Subsample A	Subsample B	Full Sample
Sex	Female	50.9	50.9	50.9*	51.6	23,085	0.6	0.6	0.6
	Male	49.1	49.1	49.1*	48.4				
Age	15-29	21.2*	21.3**	21.7	22.1	23,573	1.7	1.5	1.1
	30-39	17.2*	17.1*	16.8	16.4				
	40-49	15.2	15.2	15.1	15.2				
	50-59	15.9*	15.9**	16.0**	16.6				
	60-69	14.1**	13.9**	13.6*	13.2				
	70+	16.4	16.6	16.8	16.5				
Age * Sex	Female * 15-29	10.3**	10.3**	10.4**	11.0	23,085	2.2	2.0	1.4
	Female * 30-39	8.4	8.3	8.3	8.5				
	Female * 40-49	7.6	7.7	7.6	7.8				
	Female * 50-59	8.4	8.2	8.3	8.5				
	Female * 60-69	7.3**	7.4***	7.1**	6.7				
	Female * 70+	8.9	9.0	9.1	9.1				
	Male * 15-29	10.5*	10.7	11.1	11.0				
	Male * 30-39	8.7**	8.6**	8.3*	7.9				
	Male * 40-49	7.6	7.5	7.4	7.5				
	Male * 50-59	7.6*	7.8*	7.8*	8.2				
	Male * 60-69	7.0**	6.7	6.6	6.4				
	Male * 70+	7.7	7.8*	7.8**	7.4				
Education	No qualifications	9.9***	11.1***	12.2***	19.6	21,737	10.5	9.5	9.5
	Non degree level	54.2***	53.3***	53.3***	43.7				
	Degree and above	35.9*	35.6**	34.6***	36.6				
Ethnicity	White	89.3***	87.6***	87.6***	84.4	22,999	4.9	3.2	3.2
	Other	10.7***	12.4***	12.4***	15.6				
UK Region	North East	4.1	4.1	4.1	4.1	23,573	0.5	0.5	0.5
	North West	11.3	11.3	11.3	11.4				
	Yorkshire & Humber	8.4	8.4	8.4	8.4				
	West Midlands	9.1	9.1	9.1	9.0				
	East Midlands	7.5	7.5	7.5	7.5				
	East of England	9.5	9.5	9.5	9.7				
	South West	8.8	8.8	8.8	8.9				
	South East	14.0	14.0	14.0	14.2				
	Greater London	13.7	13.8	13.8*	13.4				
	Wales	4.9	4.9	4.9	4.8				
	Scotland	8.6	8.5	8.6	8.6				
Participant disability	Yes	17.2***	15.7***	15.6***	20.5	21,831	3.3	4.8	4.9
	No	82.8***	84.3***	84.4***	79.5				
Persons per HH size	1	16.4	16.4	16.3	16.3	23,573	0.4	0.2	0.1
	2	34.5	34.4	34.3	34.2				
	3	19.3	19.4	19.4	19.4				
	4	18.8	18.9	19	19.0				
	5+	11.0	11.0	11.1	11.0				
Acorn group	Affluent achievers	23.6	23.3	23.4	23.7	23,573	2.4	2.2	2.3
	Rising prosperity	9.4	9.6	9.6	9.6				
	Comfortable communities	27.4	27.9*	27.9*	27.3				
	Financially stretched	25.0***	24.1***	24.3***	22.9				
	Urban adversity	14.3***	14.6***	14.4***	16.4				
	Not private households / Unclassified	0.4***	0.4***	0.4***	0.1				
Housing tenure	Owned outright	36.0***	36.0***	35.4***	32.0	21,822	6.7	7.7	7.1
	Owned with mortgage/loan	33.0	30.8***	30.6***	33.4				
	Rented from council	11.3***	12.2***	12.3***	8.6				
	Rented from someone else	18.4***	19.8***	20.5***	24.0				
	Rent free	1.3***	1.2***	1.2***	2.0				
Mean dissimilarity index for sample							**3.3**	**3.2**	**3.1**

Note: The table compares, for each variable and survey administration mode, the weighted proportion of respondents in each category, with the proportion of respondents in each category for the full sample. We use a Z-test for comparing proportions. Significance levels: *p < 0.05, **p < 0.01, ***p <0.001.

Table A2 lists the questions included in the item non-response analysis, whose results were presented in Section 5.3. Most of these are "ask-all" questions (i.e. all participants must answer them). However, some questions are inapplicable to some respondents. We mark these with an asterisk (*).

Table A2. Items included in non-response analysis

Type of variable	Topic	# questions	Variable list
Socio-demographic	Work status of main income earner	7	• Work status*. • Length of unemployment. • Self-employment. • Number of people at work. • Place of work. • Source of pension income (2 questions).
	Work status of informant	7	• Work status (2 questions)*. • Self-employment (3 questions). • Number of people at work (2 questions).
	Education	4	• Highest qualification (2 questions)*. • Terminal education age (2 questions)*.
	Income	2	• Income of main income earner.* • Income of participant*.
	Others	5	• Sex*. • Marital status*. • Sexual orientation*. • Ethnic group*. • Disability status*.
Others	Shopping behaviour	3	• Main shopper expenditure. • Business air travel • Use of electronic devices*.
	Media consumption	5	• Radio (2 questions)*. • TV (2 questions)*. • Cinema*.

Note: Questions marked with an asterisk (*) are only applicable to some respondents (i.e. they are not responded by everyone in the sample).

Finally, the following tables present the detailed estimates for the multinomial logistic regression models estimated for the substantive variables (section 5.4). Table A4 presents the results of the multinomial logistic regression models for the AIR indicator, while Table A5 presents the results for the RPY indicator.

Table A3. Multinomial logistic regression models for the AIR indicators

Variable	Level	AIR: Magazines (Reference = 1: Non-readers)						AIR: Newspapers (Reference = 1: Non-readers)					
		Light readers			Moderate and high readers			Light readers			Moderate and high readers		
		Beta	SE	OR	Beta	SE	OR	Beta	SE	OR	Beta	SE	OR
Stage / Mode	Initial: Online (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Initial: Paper	-0.065	0.153	0.937	-0.211**	0.078	0.810	0.091	0.088	1.095	0.343***	0.090	1.409
	Follow-up: CATI	-0.521***	0.080	0.594	-1.296***	0.075	0.274	-0.289***	0.073	0.749	-0.439***	0.088	0.644
	Follow-up: KtN-Online	-0.244***	0.061	0.784	-0.308***	0.058	0.735	-0.188**	0.070	0.829	-0.057	0.085	0.944
	Follow-up: KtN-Paper	-0.568***	0.056	0.567	-0.926***	0.093	0.396	-0.073	0.096	0.930	-0.234*	0.099	0.791
Sex	Female (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Male	-0.594***	0.041	0.552	-0.929***	0.045	0.395	0.069	0.049	1.071	0.208***	0.053	1.231
Age	15-29 (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	30-39	0.440***	0.081	1.553	0.356***	0.084	1.428	0.200	0.110	1.221	0.205	0.141	1.228
	40-49	0.522***	0.083	1.685	0.578***	0.087	1.783	0.416***	0.107	1.516	0.477***	0.136	1.611
	50-59	0.719***	0.082	2.052	0.775***	0.082	2.171	0.679***	0.103	1.971	0.809***	0.129	2.246
	60-69	0.951***	0.092	2.589	1.077***	0.090	2.936	1.021***	0.110	2.775	1.462***	0.125	4.315
	70+	1.216***	0.096	3.373	1.304***	0.098	3.684	1.528***	0.118	4.609	2.092***	0.133	8.103
Education level	No qualifications (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	No degree	0.192*	0.074	1.211	0.201*	0.079	1.223	0.113	0.084	1.119	0.123	0.091	1.131
	Degree	0.358***	0.080	1.430	0.338***	0.086	1.402	0.120	0.092	1.127	-0.104	0.102	0.901
	Missing	0.028	0.119	1.028	0.111	0.125	1.117	0.007	0.138	1.007	0.221	0.136	1.247
Ethnicity	White British (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Other	-0.652***	0.084	0.521	-0.456***	0.085	0.634	-0.168	0.102	0.845	-0.342**	0.114	0.711
Disability	No (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Yes	-0.08	0.065	0.923	0.112	0.063	1.118	-0.193**	0.074	0.825	-0.021	0.076	0.980
	Missing	-0.16	0.099	0.852	-0.159	0.103	0.853	0.082	0.120	1.085	0.074	0.119	1.077
UK Region	North East	-0.075	0.136	0.928	0.028	0.131	1.028	-0.318*	0.160	0.728	-0.872***	0.170	0.418
	North West	-0.158	0.095	0.854	-0.417***	0.098	0.659	-0.361***	0.105	0.697	-0.956***	0.114	0.384
	Yorkshire & Humber	0.099	0.107	1.105	-0.044	0.106	0.957	-0.467***	0.114	0.627	-0.77***	0.141	0.463
	West Midlands	0.041	0.106	1.041	-0.043	0.110	0.958	-0.498***	0.119	0.608	-0.755***	0.126	0.470
	East Midlands	0.109	0.100	1.115	0.006	0.104	1.006	-0.413**	0.127	0.662	-0.743***	0.140	0.476
	East of England	-0.069	0.094	0.933	-0.027	0.103	0.973	-0.553***	0.108	0.575	-0.975***	0.123	0.377
	South West	0.233*	0.097	1.262	0.031	0.100	1.032	-0.554***	0.113	0.575	-1.021***	0.129	0.360
	South East	0.152	0.083	1.164	0.146	0.086	1.157	-0.348***	0.097	0.706	-0.665***	0.109	0.514
	London (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Wales	-0.248	0.137	0.780	-0.216	0.152	0.806	-0.490**	0.162	0.613	-0.872***	0.162	0.418
	Scotland	-0.346***	0.093	0.708	-0.345***	0.095	0.708	-0.362***	0.100	0.697	-0.671***	0.116	0.511

Variable	Level	AIR: Magazines (Reference = 1: Non-readers)						AIR: Newspapers (Reference = 1: Non-readers)					
		Light readers			Moderate and high readers			Light readers			Moderate and high readers		
		Beta	SE	OR	Beta	SE	OR	Beta	SE	OR	Beta	SE	OR
Household size	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	0.087	0.058	1.091	0.256***	0.060	1.292	0.099	0.062	1.104	0.327***	0.073	1.387
	3	-0.006	0.075	0.994	0.254**	0.078	1.289	0.024	0.093	1.024	0.238*	0.109	1.269
	4	0.090	0.078	1.095	0.388***	0.082	1.474	0.08	0.097	1.083	0.284*	0.116	1.329
	5+	0.148	0.098	1.159	0.421***	0.100	1.523	-0.009	0.127	0.992	0.201	0.147	1.223
Acorn group	Affluent achievers (*Reference)*	–	–	–	–	–	–	–	–	–	–	–	–
	Rising prosperity	-0.201*	0.082	0.818	-0.275**	0.085	0.759	0.069	0.091	1.072	-0.107	0.116	0.899
	Comfortable communities	-0.159**	0.054	0.853	-0.19***	0.056	0.827	-0.227***	0.064	0.797	-0.233**	0.073	0.792
	Financially stretched	-0.135	0.069	0.874	-0.185**	0.066	0.831	-0.033	0.082	0.967	0.052	0.086	1.053
	Urban adversity	-0.223*	0.088	0.800	-0.301***	0.089	0.740	-0.101	0.102	0.904	0.004	0.120	1.004
	Not private households/Unclassified	0.423	0.264	1.527	0.156	0.275	1.169	0.270	0.349	1.310	0.327	0.336	1.387
Tenure	Owned outright (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Owned with mortgage/loan	-0.060	0.064	0.942	-0.289***	0.063	0.749	-0.329***	0.077	0.720	-0.435***	0.093	0.647
	Rented from council	-0.115	0.094	0.891	-0.099	0.089	0.906	-0.127	0.102	0.880	-0.099	0.119	0.906
	Rented from someone else	-0.070	0.073	0.932	-0.176*	0.077	0.839	-0.289**	0.090	0.749	-0.253*	0.104	0.776
	Rent free	0.115	0.197	1.122	0.241	0.233	1.272	0.169	0.259	1.184	0.394	0.262	1.483
	Missing	-0.162	0.119	0.851	-0.139	0.111	0.870	-0.379**	0.139	0.684	-0.175	0.139	0.839
Intercepts		-1.358***	0.153	0.257	-1.112***	0.152	0.329	-2.073***	0.170	0.126	-2.433***	0.187	0.088

Model fit		
Log-likelihood (*)	-268,220	-188,695
Residual deviance	536,440	377,392

Note: Reference is level 1 (No publications read during the circulation period). Significance levels: ***-p <0.001, **-p<0.01, *-p<0.05

Table A4. Multinomial logistic regression models for the RPY indicators

Variable	Level	RPY: Magazines (Reference = 1: Non-readers)						RPY: Magazines (Reference = 1: Non-readers)					
		Light readers			Moderate and high readers			Light readers			Moderate and high readers		
		Beta	SE	OR	Beta	SE	OR	Beta	SE	OR	Beta	SE	OR
Stage / Mode	Initial: Online (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Initial: Paper	0.031	0.077	1.031	-0.594***	0.090	0.552	0.209**	0.068	1.233	-0.021	0.099	0.979
	Follow-up: CATI	-0.919***	0.058	0.399	-1.891***	0.086	0.151	-0.355***	0.054	0.701	-1.33***	0.110	0.265
	Follow-up: KtN-Online	-0.323***	0.052	0.724	-0.388***	0.059	0.679	-0.252***	0.049	0.777	-0.292***	0.069	0.746
	Follow-up: KtN-Paper	-0.615***	0.074	0.540	-1.484***	0.096	0.227	-0.156*	0.071	0.856	-0.817***	0.111	0.442
Sex	Female (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Male	-0.586***	0.037	0.557	-1.541***	0.047	0.214	0.079*	0.034	1.082	0.273***	0.052	1.314
Age	15-29 (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	30-39	0.401***	0.065	1.493	0.663***	0.082	1.941	0.346***	0.066	1.413	0.140	0.099	1.150
	40-49	0.529***	0.070	1.697	0.993***	0.084	2.699	0.597***	0.066	1.817	0.456***	0.103	1.578
	50-59	0.629***	0.071	1.875	1.107***	0.082	3.026	0.699***	0.065	2.013	0.786***	0.098	2.195
	60-69	0.757***	0.078	2.131	1.161***	0.095	3.193	0.971***	0.074	2.641	0.967***	0.112	2.629
	70+	0.916***	0.085	2.499	1.111***	0.104	3.038	1.474***	0.078	4.369	1.139***	0.123	3.122
Education level	No qualifications (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	No degree	0.210**	0.065	1.233	0.316***	0.087	1.371	0.201***	0.061	1.223	0.35**	0.116	1.419
	Degree	0.487***	0.071	1.628	0.589***	0.093	1.802	0.407***	0.065	1.502	0.567***	0.121	1.763
	Missing	-0.010	0.099	0.991	0.073	0.139	1.075	0.102	0.094	1.107	0.421**	0.163	1.523
Ethnicity	White British (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Other	-0.580***	0.073	0.560	-0.697***	0.087	0.498	-0.177**	0.065	0.838	-0.264**	0.094	0.768
Disability	No (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Yes	0.004	0.057	1.004	0.042	0.068	1.042	-0.114*	0.052	0.892	-0.043	0.086	0.958
	Missing	-0.175*	0.085	0.839	-0.204	0.107	0.815	0.102	0.094	1.107	0.421**	0.163	1.523
UK Region	North East	0.033	0.114	1.033	0.204	0.134	1.227	-0.726***	0.103	0.484	-1.013***	0.131	0.363
	North West	-0.307***	0.084	0.736	-0.257*	0.105	0.773	-0.819***	0.083	0.441	-1.111***	0.113	0.329
	Yorkshire & Humber	0.103	0.100	1.109	0.189	0.122	1.208	-0.582***	0.087	0.559	-0.933***	0.145	0.393
	West Midlands	-0.055	0.092	0.947	0.089	0.111	1.093	-0.692***	0.086	0.501	-0.977***	0.132	0.376
	East Midlands	-0.008	0.099	0.992	0.075	0.111	1.078	-0.805***	0.089	0.447	-0.955***	0.136	0.385
	East of England	-0.112	0.093	0.894	-0.233*	0.111	0.792	-0.789***	0.088	0.454	-1.105***	0.123	0.331
	South West	0.201*	0.089	1.222	0.197	0.111	1.218	-0.795***	0.079	0.451	-1.464***	0.125	0.231
	South East	0.235**	0.078	1.265	0.229*	0.095	1.258	-0.564***	0.073	0.569	-0.821***	0.099	0.440
	London (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Wales	-0.245*	0.112	0.783	-0.074	0.138	0.929	-0.947***	0.098	0.388	-1.223***	0.168	0.294
	Scotland	-0.291***	0.084	0.748	-0.250*	0.098	0.778	-0.731***	0.083	0.481	-1.023***	0.103	0.360

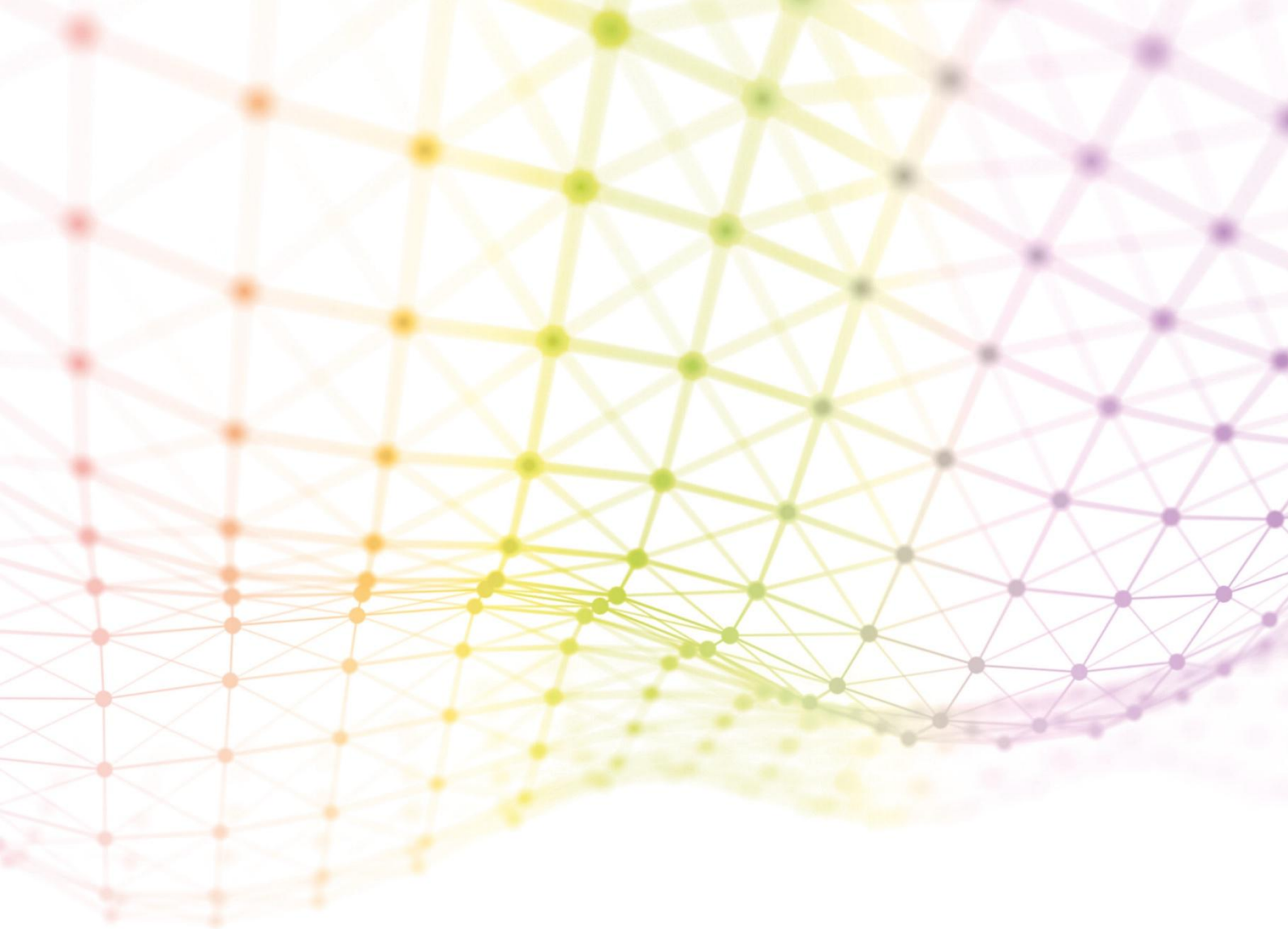
Variable	Level	RPY: Magazines (Reference = 1: Non-readers)						RPY: Magazines (Reference = 1: Non-readers)					
		Light readers			Moderate and high readers			Light readers			Moderate and high readers		
		Beta	SE	OR	Beta	SE	OR	Beta	SE	OR	Beta	SE	OR
Household size	1	–	–	–	–	–	–	–	–	–	–	–	–
	2	0.148**	0.054	1.160	0.213**	0.065	1.237	-0.017	0.048	0.983	-0.015	0.075	0.985
	3	0.137*	0.069	1.147	0.225**	0.083	1.252	-0.039	0.064	0.962	0.06	0.097	1.062
	4	0.200**	0.070	1.222	0.351***	0.083	1.421	0.079	0.067	1.083	0.179	0.103	1.196
	5+	0.114	0.086	1.120	0.247*	0.106	1.280	-0.067	0.082	0.935	0.227	0.124	1.255
Acorn group	Affluent achievers (*Reference)*	–	–	–	–	–	–	–	–	–	–	–	–
	Rising prosperity	-0.089	0.072	0.915	-0.165	0.085	0.848	-0.015	0.068	0.985	0.061	0.098	1.063
	Comfortable communities	-0.103*	0.050	0.902	-0.191**	0.059	0.826	-0.143**	0.047	0.867	-0.220**	0.073	0.802
	Financially stretched	-0.186**	0.061	0.831	-0.288***	0.070	0.750	-0.011	0.057	0.989	0.058	0.084	1.060
	Urban adversity	-0.249***	0.075	0.780	-0.29**	0.092	0.748	-0.069	0.070	0.933	0.106	0.109	1.112
	Not private households/Unclassified	-0.093	0.229	0.912	-0.354	0.290	0.702	-0.173	0.218	0.841	-0.087	0.361	0.917
Tenure	Owned outright (*Reference*)	–	–	–	–	–	–	–	–	–	–	–	–
	Owned with mortgage/loan	-0.141*	0.059	0.868	-0.150*	0.067	0.860	-0.183***	0.053	0.833	-0.272***	0.081	0.762
	Rented from council	-0.206**	0.080	0.814	-0.083	0.093	0.921	-0.095	0.074	0.909	0.018	0.113	1.018
	Rented from someone else	-0.214***	0.064	0.808	-0.191*	0.077	0.826	-0.226***	0.063	0.798	-0.163	0.093	0.849
	Rent free	-0.093	0.192	0.911	0.203	0.237	1.225	0.093	0.190	1.097	0.242	0.236	1.273
	Missing	-0.216*	0.100	0.806	-0.188	0.120	0.829	-0.362***	0.096	0.696	-0.198	0.129	0.820
Intercepts													

Model fit		
Log-likelihood (*)	-301,327	-277,774
Residual deviance	602,653	555,549

Note: Reference is level 1 (No publications read during the circulation period). Significance levels: ***-p <0.001, **-p<0.01, *-p<0.05

Table A5: PRICSSA Item Checklist

	Name and wave of survey	National Readership Survey 2022
1.1	Data collection dates	4 January 2022 – 3 January 2023
1.2	Data collection modes	Self-administered web and paper, computer-assisted personal interviews (CAPI)
1.3	Target population	Individuals aged 15 years or over residing in households of Great Britain (England, Wales, and Scotland).
1.4	Sample design	Two-stage sample design. Sampling points were selected first and addresses within these points were selected second. Up to two respondents were invited to participate within each household.
1.5	Response rate	38% (AAPOR 5)
2.1	Missingness rates	3.8% of observations with missing information on sex and ethnicity were excluded from the substantive data analysis
2.2	Observation deletion	Does not apply
2.3	Sample sizes	23,573 respondents within 19,257 households
2.4	Confidence intervals or standard errors	Models for substantive data include standard errors accounting for survey design
2.5	Weighting and weight variables	Post-stratification weights were used in modelling.
2.6	Variance estimation method and variables:	Taylor series linearisation implemented with the svydesign and svyVGAM R packages. Primary sampling unit: ID Clustering variable: sample_point Weight: weight
2.7	Subpopulation analysis:	Does not apply
2.8	Suppression rule:	Does not apply
2.9	Software and code:	All models are estimated using the *survey* package in R (Lumley 2024), incorporating post-stratification weights and design-based clustering. R code is available



University of Essex

University of Southampton

UKRI Economic and Social Research Council

NCRM National Centre for Research Methods

Office for National Statistics

UCL

Warwick The University of Warwick

Manchester 1824 The University of Manchester

City University of London Est 1894

National Centre for Social Research

LSE The London School of Economics and Political Science

Ulster University

Unil UNIL | Université de Lausanne

Ipsos

verian Formerly Kantar Public

www.surveyfutures.net