

# Mode effects in reporting and response of moved household members in a household panel survey

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## SUMMARY

To maintain sample size and representativeness in household panel surveys, it is essential that household reference persons provide contact details of household members who have left the household, and subsequently that these household members continue their participation and introduce new households in the sample. As more household panel surveys transition from interviewer-based modes to web-based modes, a key unanswered question is whether web-based surveys are equally successful as interviewer-based surveys in maintaining cooperation of household members who left the household. Without the assistance of an interviewer — who typically provides motivation and social control — there is a risk of significant underreporting of moved household members in the web mode.

In this paper, we compare the telephone and web modes using data from a mode experiment and a refreshment sample of a probability sample household panel survey. The experiment shows no significant difference between the modes, suggesting no mode effects. While this is reassuring, the refreshment sample, — in which households are assigned to modes based on the availability of a telephone number — reveals a different picture. Although households in the web group contain more mobile sample members, household reference persons in the web group are less likely to report new addresses. This is an issue that should be considered when the shift to web is made. More research is needed to find an optimal balance between ease of mode assignment and adequate reporting of moved household members.

Keywords: reporting moved household members, household panel survey, web, telephone

## 1. INTRODUCTION AND MOTIVATION

Cost pressures (Olson et al. 2021) and declining response rates, even in expensive interviewer-administered surveys (Jabkowski & Cichocki 2024), are the main drivers for the increasing use of web mode. While it can reduce costs and provide better population coverage in developed countries, shifting to the web can increase non-response (Daikeler et al. 2020) and attrition (Voorpostel et al. 2021a).

In household panel surveys, one lesser-known challenge of changing from interviewer-based modes to the web is successfully tracing and re-interviewing individuals who left the household and are still interview eligible. Data from the face-to-face European Statistics on Income and Labor Conditions EU-SILC (2003-2010) showed that in splitting households only 26% of eligible individuals who moved could be traced and interviewed, compared to 96% of individuals who remained in the original household (lacovou & Lynn 2017, p.483). Moreover, if a leaving household member moves in with others, unsuccessful follow-up means that these new household members also do not participate in the study.<sup>1</sup>

In terms of maintaining sample size and population representativeness, full reporting and participation of moving individuals becomes increasingly important over the life of a household panel. Around two-thirds of leaving household members are young adults up to the age of 35 (lacovou & Lynn 2017, p.485), the age at which people form households and start their own families. A simulation based on the Household, Income and Labour Dynamics in Australia (HILDA) panel study showed that unsuccessful follow-up can lead to small and biased samples in the long run, and that wider following rules produce much larger samples (Watson 2022). For example, when only first wave respondents and their offspring are followed (as is the case for the UKHLS<sup>2</sup>), a sample of 20'000 would grow to 36'000 after 40 waves if all eligible sample members participated, or to 54'000 if also everyone who joins a household is included as is done in HILDA.<sup>3</sup> When including all new members of existing households, moved individuals, and people living with moved individuals, and if everyone who is eligible responds, a sample of 20'000 members would grow to 3.9 million members after 40 waves (p.312).

Wider following rules produce much larger samples by including proportionally many more people in their 20s and 30s, a correspondingly higher proportion of young children and a lower proportion of people aged 40 and over. This means that wider following rules help to retain (and generate) sample members with higher family formation rates, thus increasing the sample size and avoiding (over)aging of the panel, if an adequate reporting of new addresses of moved household members, a successful tracing, high response rates, and low attrition rates can be achieved. With respect to the latter, for example, in contrast to HILDA, a panel with an annual attrition rate of about 8% such as the Swiss Household Panel (SHP) needs to be refreshed with almost 40% of wave 1 households every six years<sup>4</sup> to maintain the sample size.

In this paper, we examine the extent to which household reference persons reported moved household members and their new address, and the extent to which moved household members continue their participation in the survey in interviewer-based and in self-

<sup>&</sup>lt;sup>1</sup> Depending on the following rules of the panel survey.

<sup>&</sup>lt;sup>2</sup> UK Household Longitudinal Survey.

<sup>&</sup>lt;sup>3</sup> UK Household Longitudinal Survey.

<sup>&</sup>lt;sup>4</sup> After 6 years, the percentage of households remaining is  $(1-0.08)^6 = 0.606$ .

administered survey modes. To this end, we analyze data from an experiment where telephone and web modes were randomly assigned to households. In addition, we examine data from a refreshment sample, in which households were assigned to the telephone or web mode according to telephone availability. The findings of this paper will provide valuable insights into the impact of shifting from interviewer-based to web-based survey modes on long-term sample size and composition in household panel surveys. Whereas the random assignment to modes in the experiment implies that any differences between web and telephone more strongly reflect a measurement difference between the modes, mode differences in the refreshment sample would be the result of both selection into the mode as well as any measurement differences between modes.

# 2. REPORTING OF HOUSEHOLD SPLITS AND RE-INTERVIEWS IN OTHER SURVEYS AND MODE EFFECTS

To our knowledge, there is only one published study documenting the reporting of household splits and the proportion of the sample re-interviewed after a household split (lacovou & Lynn 2017)<sup>5</sup>. This study used data from the EU-SILC (2003-2010). As a rotating panel, the EU-SILC design keeps sample members in the sample for a fixed number of consecutive waves (4 waves in most countries), before they are replaced by a new sample. This means that one quarter of the sample is replaced by design each year.

In EU-SILC, almost all adult members of sample households are designated as sample members to be followed. Movers leave the sample when they move to an institution or abroad. Iacovou & Lynn (2013) estimated that around 7% of sample members experienced household splits in any year, of which 4% could be identified in EU-SILC (Iacovou & Lynn 2017, p.482). Of the household splits, 53% resulted from a young adult (aged 16-35) leaving the parental home, 17% from divorce or separation, 4% from both reasons, and 10% from a young adult leaving the non-parental home (op. cit. p.485).

Collecting data by web instead of face-to-face interviews such as EU-SILC presents an even greater challenge to obtain contact information on individuals who left the household, as absence of an interviewer increases the likelihood that moves may go unreported. Interviewers can motivate respondents to complete the task, ask for more consistency or more detail, provide help or motivation, or more explanation if a question is not understood (Dillman 2011). Another reason is that due to the lack of social control in web surveys there is an increased risk of investing less cognitive effort and therefore giving a suboptimal response, also known as 'satisficing' (Simon 1957), rather than 'optimizing' (Krosnick 1991). As a result, respondents may rush through the questionnaire or skip parts of a question in web surveys (Anduiza & Galais 2017). This can lead to measurement errors such as underreporting of events (Lipps & Voorpostel 2021), for example in parts that involve listing all current household members and the whereabouts of those who have moved. With the increasing shift from interviewer-based methods to push to web-based data collection (e.g., Voorpostel et al., 2021b), there is a growing need for research on how this transition affects successful tracing of individuals who have moved to new households.

<sup>&</sup>lt;sup>5</sup> This 2017 chapter is part of a book which represents major outputs from the second 'Network for the Analysis of EU-SILC'. The chapter was published in more detail earlier in an ISER working paper (Iacovou & Lynn 2013).

Based on these considerations, we expect web respondents to report fewer people leaving the household, and fewer valid addresses of leaving household members than telephone respondents. In the following part, we will investigate this hypothesis empirically.

# 3. DATA AND METHODS

We use data from the Swiss Household Panel (Tillmann et al. 2021), a longitudinal study that has interviewed households and all members aged 14 and over annually since 1999, mainly by telephone. To compare telephone and web, we use data from two samples<sup>6</sup>:

- The SHP\_IV pilot (SHP Group 2020), in which both modes were randomly assigned to a gross sample of 4'195 households followed for two waves (Voorpostel et al. 2021a,b). The SHP\_IV pilot allows for the identification of mode effects with only a small selection into the modes. Results from the SHP\_IV pilot were used to inform the design of the SHP\_IV refreshment<sup>7</sup> sample.
- 2. The SHP\_IV refreshment sample (SHP Group 2024), in which households with a known landline number were assigned to telephone, and those without a landline number were assigned to the web. The SHP\_IV refreshment gross sample consisted of 8'393 households.

The sample for both designs was a simple random sample of individuals stratified by region, drawn from a sampling frame based on population registers and maintained by the Swiss Federal Statistical Office. In both designs, the household reference person (HRP) provided information on all household members (grid questionnaire), household characteristics (household questionnaire), and completed an individual questionnaire. All household members aged 14 or over were also invited to complete an individual questionnaire. The sampled individual was first approached as an HRP, although households were free to choose an HRP other than the one initially approached and HRPs could change between waves. Below we describe the differences between the design of the SHP\_IV pilot and the design of the SHP\_IV refreshment.

In wave 1 of the *SHP\_IV pilot*, HRPs were randomly assigned to either telephone or web for the completion of the grid and household questionnaire. Households assigned to web, for which a telephone number was available, were approached for a nonresponse follow-up by telephone (9% of the web households were approached by telephone upon initial nonresponse) while households assigned to the telephone for which no telephone was available were approached by face-to-face (29% of the telephone group). This resulted in a mix of modes including some small mode selection effects, but with telephone and web being the dominant modes. In wave 1, the response rates (RR1; AAPOR 2023) at the household level were 52% for the telephone group (n=1'556 responding households) and (significantly different on the 1% level) 47% for the web group (n=574 responding households).

Households that completed at least the grid in wave 1 were recontacted for wave 2. Households were reapproached with the same survey mode as in wave 1, apart from a random part of the telephone sample that switched to web. We assume that there were no carry-over

<sup>&</sup>lt;sup>6</sup> We use variables from the grid questionnaire, some of which are not available in the published data, but which can be requested from the corresponding author.

<sup>&</sup>lt;sup>7</sup> For the three existing samples SHP\_I - SHP\_III, the web has not yet played a major role.

effects of the survey mode from wave 1 and have pooled the households by assigned survey mode.<sup>8</sup> The subsequent re-interview rates were 77% for the telephone group, and 76% for the web group.

The 2020 SHP\_IV refreshment sample has currently been surveyed for four waves and has relied on telephone and web as survey modes only. RR1 response rates at the household level in wave 1 were 59% for the telephone group (n=2'427 responding households with a registered telephone number) and (significantly different on the 1% level) 45% for the web group consisting of households for which a telephone number was not available (n=1'953 responding households). Households with completed household grids in the first wave were recontacted in wave 2. The re-interview rates were 78% (77%, 72%) in 2021 (2022, 2023) for the telephone group, and 62% (75%, 56%) in 2021 (2022, 2023) for the web group. Except in 2022, attrition was higher in the web group (5% level).

In both samples, in wave 2, all household members reported in wave 1 were listed, and the HRP was asked for each household member whether they were still living in the household. If a household member had moved away from the household, the HRP was prompted for the month and year of departure, for the reasons for departure and the new address. These individuals were then contacted to be included as a new household.

## 4. RESULTS

In Table 1, we provide the information available on household members that left participating households in the SHP\_IV pilot (wave 2) and the SHP\_IV refreshment sample (waves 2-4) by mode.

2017/18 SHP IV Pilot	Telephone group	Web group
Assignment	Random	Random
Wave 2	N=2'575 individuals	N=2'017 individuals
Reported number persons left household	92 (4%)	91 (5%)
Of whom: interview eligible persons#	68 (74%)	63 (69%)
Of whom: new addresses given	38 (56%)	31 (49%)
Of whom: responded	26 (68%) 22 (71%)	
2020 SHP IV Refreshment	Telephone mode	Web mode
Assignment	With landline (from	No landline (from register)
	register)	
Waya 2	N-E'224 individuals	N-2'404 individuals
wave z		
Reported number persons left household	259 (5%)	127 (4%)
Of whom: interview eligible persons#	196 (76%)	94 (74%)
Of whom: new addresses given	114 (58%)	23 (24%)
Of whom: responded	50 (44%)	6 (26%)

Table 1: Information provided on left eligible household members, by mode.

<sup>8</sup> In a robustness study, we restricted the pilot sample to only the households that were randomly assigned to telephone/web in wave 2 after having answered in the telephone mode in wave 1. The results were very similar to those listed in Table 1 for the full wave 2 pilot.

Wave 3 Reported number persons left household Of whom: interview eligible persons# Of whom: new addresses given Of whom: responded	N=4'145 individuals 156 (4%) 118 (76%) 81 (69%) 32 (40%)	N=2'593 individuals 61 (2%) 48 (79%) 7 (15%) 2 (29%)
Wave 4	N=3'591 individuals	N=2'480 individuals
Reported number persons left household	143 (4%)	65 (3%)
Of whom: interview eligible persons#	111 (78%)	53 (82%)
Of whom: new addresses given	63 (57%)	16 (30%)
Of whom: responded	23 (37%)	2 (13%)

# Eligible if household member left for these reasons: Don't know, separation, left household definitively, other reason.

In the pilot sample, we found similar percentage values in the telephone and the web (in parentheses) group: 4(5)% of household members were reported as having left the household in wave 2, of whom 74(69)% were interview eligible, of whom 56(49)% were given the new contact address, of whom 68(71)% were eventually re-interviewed. Interestingly, in relative terms, slightly more people were reported in the web group.

In the refreshment sample, fewer new addresses were provided in the web mode and the proportion of the eventually re-interviewed household members was substantively lower in all waves. In wave 3 and 4, HRPs reported substantively fewer moved household members in the web mode.

Next, we analyzed whether the difference in the number of reported moves in the refreshment sample could be attributed to differences in the sample composition of the modes with respect to two key variables. Specifically, we examined the proportion of individuals aged 19 to 32 (the age group with the highest probability of moving) and whether the intention to move within the next 12 months differs across modes.<sup>9</sup> For reference, we also present values for both the pilot and refreshment samples.

2017/18 SHP IV Pilot	Telephone group	Web group	
Assignment	Random	Random	
Wave 1 respondents			
Intention to move [mean (se)]	1.52 (0.07) (N=1'910)	1.66 (0.08) (N=1'333)	
Proportion age 19-32 [%]	0.18 (0.01) (N=1'971)	0.19 (0.01) (N=1'413)	
2020 SHP IV Refreshment	Telephone mode	Web mode	
Assignment	With landline (from register)	No landline (from register)	
Wave 1 respondents			
Intention to move [mean (se)]	1.27 (0.04) (N=4'451)	2.23 (0.06)** (N=2'844)	
Proportion age 19-32 [%]	0.13 (0.00) (N=4'499)	0.25 (0.01)** (N=3'058)	

Table 2: Intention to move and individuals aged 19-32 in the SHP\_IV, by mode.

<sup>&</sup>lt;sup>9</sup> The question reads: «In the coming 12 months, what does your intention to move look like, if 0 means "no intention to move at all" and 10 means "certainly"»

Wave 2 respondents		
Intention to move [mean (se)]	1.23 (0.05) (N=3'384)	2.24 (0.08)** (N=1'908)
Proportion age 19-32 [%]	0.13 (0.01) (N=3'403)	0.21 (0.01)** (N=2'067)
Wave 3 respondents		
Intention to move [mean (se)]	1.06 (0.05) (N=2'746)	2.09 (0.08)** (N=1'520)
Proportion age 19-32 [%]	0.14 (0.01) (N=2'760)	0.18 (0.01)** (N=1'613)
Wave 4 respondents		
Intention to move [mean (se)]	1.22 (0.06) (N=2'356)	1.85 (0.08)** (N=1'399)
Proportion age 19-32 [%]	0.15 (0.01) (N=2'377)	0.16 (0.01) (N=1'520)

Question: In the coming 12 months, what does your intention to move look like, if 0 means "no intention to move at all" and 10 means "certainly". Item missing values dropped. \* (\*\*) significantly different from telephone on 5(1)% level.

In the pilot sample, there was no significant difference between the two survey modes in terms of the intention to move or the proportion of respondents with a high probability of moving (ages 19-32). However, in the refreshment sample, both variables were significantly different between the two modes in all waves, except for age in wave 4.

The intention to move and the proportion of respondents with a high probability of moving were higher in the web mode. This suggests that we should anticipate more moves in the web mode in the refreshment sample. Consequently, the even slightly lower proportions of reported moves in the web mode, as shown in Table 1, likely reflect a significant underreporting of moves, with many actual moves not being captured. This effect was amplified for the number of new addresses that were provided.

In the final step of our analysis, we investigated how the data collection mode affected 1) the number of moves reported and 2) the number of addresses provided in the refreshment sample (and, for completeness, in the pilot sample). For these analyses, we controlled for participants' intentions to move in the previous wave and focused specifically on those aged 19-32. Table 3 presents the results of the linear regression models used in this examination.

	DV: repor	DV: reported moves		ess given
	Pilot	Refreshment	Pilot	Refreshment
Lagged intention to move	0.015**	0.010**		
	(0.001)	(0.000)		
Web	0.001	-0.018**	-0.075	-0.363**
	(0.006)	(0.003)	(0.088)	(0.041)
Age 19-32	0.075**	0.086**	0.040	0.052
	(0.009)	(0.004)	(0.093)	(0.044)
Wave 3		-0.008*		0.050
		(0.003)		(0.046)
Wave 4		-0.011**		0.019
		(0.003)		(0.046)
Intercept	-0.007	0.010**	0.549**	0.553**
	(0.004)	(0.002)	(0.087)	(0.046)
Number of observations	2734	14056	130	611

Table 3: Linear regression of reported moves and addresses given on mode in the SHP\_IV (pilot and refreshment), coefficients (standard errors).

R-squared	0.13	0.09	0.01	0.12

\* (\*\*) significantly different from telephone on 5(1)% level.

First, we examined reported moves. As expected, moves were generally well anticipated, and when there was a larger share of young adults, there were more reported moves. The number of moves decreased each wave in the refreshment sample. In the pilot sample, the mode did not affect reported moves, which is consistent with the figures shown in Table 1.

In the refreshment sample, fewer moves were reported in the web mode compared to the telephone mode, even after controlling for age and intention to move, further confirming the results in Table 1. It is not surprising that the effect remained in the regression model, as there was already a larger share of young people and the higher intention to move with fewer household members reported leaving in the web mode.

Regarding the willingness of HRPs to report addresses, we again found no mode effect in the pilot sample, whereas in the refreshment sample, the negative effect of the web mode is even stronger than for reporting moves. This indicates again that selection into web drives the differences between the modes more than measurement effects — contrary to our expectations.

## 5. CONCLUSIONS

In this paper, we investigated the differences between web and telephone survey modes in successful follow-up of household members that leave original households and introduce new households. Successfully re-interviewing moving household members is crucial for maintaining long-term sample sizes and observing changes in household panels. Specifically, we compared the modes with respect to differences in the number of household members that HRPs reported to have left the household, the number of new addresses that they provided, and the number of moved members that were successfully re-interviewed. To this end, we used data from a mode experiment (pilot) and from the subsequent refreshment sample implemented in the Swiss Household Panel. In the refreshment sample, households with a known telephone number are assigned to the telephone, and those without to the web. While the pilot, in which households were assigned at random to a survey mode, has the advantage of being less susceptible to mode selection effects, it had a smaller sample size and fewer waves. In addition, the mode assignment in the refreshment sample was likely better suited to the respondents' needs.

While about 7% of the population experience a household split in any given year (lacovou and Lynn 2013, p.10, FN 8), the observed rate in the (mostly face-to-face) EU-SILC survey between 2003 and 2010 was lower, where 4% of households experienced split in any year (lacovou & Lynn 2017, p.482). In our study, in both the wave 2 SHP\_IV pilot and the refreshment sample, these rates were between 4% and 5% and therefore close to those from the EU-SILC. In addition, while the re-interview rates of the reported moves were 26% in the EU-SILC (lacovou & Lynn 2017, p.483), they amounted in the pilot sample to 26/92=28% in the telephone group, and to 22/91=24% in the web group, and in the refreshment sample to 50/259=19% in the telephone mode, and to only 6/127=5% in the web mode. Finally, while the probability to move was equal in both groups in the pilot, there were more people with a high probability to move

in the web mode in the refreshment sample. Overall, these findings suggest that the differences by mode are the result of selection effects into the mode, rather than of the mode itself. This is the case when it comes to providing new addresses by the household reference person, but also with respect to the cooperation of the moved household member to continue participating in the study. We conclude that we find no support for the hypothesis that the presence of the interviewer leads to providing more new addresses and ultimately to more moved household members who continue participating.

In summary, the households that participated by web in the refreshment sample produced very few new households that could be added to the sample. For EU-SILC as a four-wave rotating panel, the statement of lacovou and Lynn (2013) may be true: "numerically speaking, the failure to follow household splits does not make a major contribution to attrition rates across the sample in general; because only around 7% of individuals experience a household split in any one year and because those household members who stay put after the split have high relatively re-interview rates, the low reinterview rates for the movers will not have a very large impact on overall re-interview rates" (p.12). However, in long-term panel surveys such as the SHP, the inability to follow and survey moving sample members erodes the sample in the longer term. This is especially relevant because most movers are young adults, who are more likely to start families. Including them helps increase the sample size and prevents the panel from becoming dominated by older age groups. If the study aims to analyze the effects of moving and newly formed households, a significant shortage or bias in the number of movers could make such analyses unreliable or even impossible. Moreover, failure to follow young people leaving the parental home makes it harder to study specific transitions in the life course that occur around that moment. Examples are transitions in education, labor market entry, and cohabitation.

Assigning participants to web based on ease of administration and likely participation is a practical approach, but our study finds that the households that participate by web are more likely to have household members with a higher likelihood of moving while at the same time these households have a lower probability to provide information that allows successful following of these household members, and as a result successfully adding new households to the sample. More research is needed to explore if it is only selection into the mode that plays a role, or whether there is an interaction between mode selection and measurement differences by mode that affects participants' willingness to report these changes. Experimental studies could help clarify these effects and provide deeper insights.

Our research has some shortcomings: first, it cannot be excluded that there are some (small) selection effects in the pilot. However, the similarity of key socio-demographic characteristics suggests that randomization worked well across respondents in the two designs. Second, as noted above, the selection in the refreshment sample is probably quite large, so that the effects found are due to an unknown selection effect. An analysis of some different sociodemographic characteristics asked in the grid questionnaire (sex, age, occupation, nationality education) confirms that the differences by mode are much stronger in the refreshment sample compared with the pilot. Third, the sample sizes are relatively small in the pilot and not much larger in the refreshment sample. This makes it difficult to study subgroups. Fourth, we tested a design with a specific pre-assigned mode in the refreshment sample. Other pre-assignments may lead to different results. Fifth, the results are highly dependent on the specific tracing methods used by the survey agency. This limits the ability to generalize the results.

Despite these shortcomings, we believe our findings underscore the importance of accurately recording, tracing, and re-interviewing movers, especially at a time when many household panel surveys are moving to the web. It may be advisable to anticipate such changes, particularly in the web mode, for example by contacting households between waves, and offering incentives for reporting addresses of household members when they leave the household (Couper & Ofstedal 2009). As well as reducing the need for costly tracing, such proactive techniques can be a cost-effective way of keeping in contact with sample members who have moved.

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