

Panel attrition in LISS

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1 Introduction

Household panel surveys suffer from attrition. To some extent, this is unavoidable, e.g., when the last household member dies. Households may also leave the panel for various other reasons. Incentives may not be sufficient to keep households in, especially when questionnaires are considered to be too invasive or simply too much trouble to fill out for the n-th time.

In order to maintain a panel of sufficient size, data collectors will attempt to minimize attrition and they will recruit new households to replace the ones that left the panel. For both purposes (minimizing attrition and recruitment of new households) it is important to know whether specific types of household are especially likely to leave the panel. For one thing, this may provide indications how panel attrition might be prevented, and for another, this informs the data collector which types of households should be recruited in order to keep the survey as representative as possible.

In this paper we check whether panel attrition in LISS is largely random or whether specific groups have especially high or low attrition rates – apart from a possibly higher death toll among the elderly. We use data about panel attrition between January and November 2008. In section 2 we present attrition rates differentiated by various household characteristics and in section 3 we present some results of a multivariate analysis of attrition. Section 4 concludes

2 Attrition differentiated by household characteristics

In Table 1 we present the percentages of households who have left the LISS panel between January 1, 2008 and November 24, 2008, differentiated by various household characteristics. We also subdivide between households who have left before and after July 1, 2008. All in all, 6.2% of the households (who ever filled out the household questionnaire and had not left the panel before January 1, 2008) left the panel in the period in question. Almost half of these households left before July 1.

Differentiated by age group of the oldest household member, we find that attrition differs significantly between the young (age below 25) where it is clearly the lowest with 2.9% and the oldest (age 75+) where it is the highest with 10.7%. Differentiated by the number of persons in paid employment we find that attrition is highest (8.9%) when there are three or more household members in paid employment, and lowest when (5.0%) when there are two household members in paid employment. In addition, when the household includes disabled persons, with 3.4.% attrition is clearly below the average. On the other hand, with the presence of pensioners, attrition increases to 7.8%. Finally, households whose internet or PC is provided by LISS have an attrition rate of only 2.5%.

There are no significant differences in attrition when we differentiate by the other characteristics, such as gender, household size, type of tenure, highest education level, the presence or absence of students, self-employed, unemployed and homemakers, level of urbanization and household type.

Table 1. Attrition by household characteristics

		before 1-7		after 1-7
		% quits		
total		6.2	3.0	3.3
age oldest	< 25	2.9	0.0	2.9



	25 - 34	4.2	1.8	2.4
	35 - 44	5.7	3.0	2.6
	45 - 54	6.3	2.9	3.3
	55 - 64	6.9	3.1	3.8
	65 - 74	6.9	3.1	3.8
	75+	10.7	6.0	4.8
gender	men only	5.7	3.3	2.4
	women only	5.9	2.7	3.2
	both	6.4	3.0	3.4
household size	1	5.9	3.1	2.8
	2	6.3	2.6	3.7
	3	7.3	4.0	3.3
	4	5.5	3.0	2.6
	5	7.3	2.4	4.8
	6+	3.6	2.4	1.2
tenure	homeowner	6.2	2.8	3.3
	tenant	6.4	3.4	3.0
highest education	primary	8.3	4.2	4.2
	lower vocational	6.7	3.2	3.5
	general secondary vocational	6.6	2.9	3.7
	secondary	5.4	2.2	3.1
	vocational tertiary	6.2	3.5	2.8
	university	6.2	2.8	3.3
	unknown	6.6	2.5	4.1
in paid empl.	none	7.2	3.6	3.6
	one	6.1	2.8	3.4
	two	5.0	2.4	2.6
	three or more	8.9	4.1	4.8
disabled	none	6.4	3.1	3.3
	one or more	3.4	1.6	1.9
pensioner	none	5.9	2.7	3.1
	one or more	7.8	4.0	3.8
student	none	6.5	3.1	3.3
	one or more	5.8	2.7	3.1
family/self-empl	none	6.0	2.7	3.2
	one or more	7.5	4.2	3.3
unemployed	none	6.2	3.0	3.2
	one or more	5.1	0.6	4.5
homemaker	none	6.0	2.8	3.1
	one or more	7.3	3.5	3.8
other	none	6.1	2.8	3.2
	one or more	7.0	3.7	3.3
urban/rural	very urban	6.7	4.0	2.6
	urban	6.1	2.4	3.7
	moderately urban	5.6	2.9	2.7
	hardly urban	6.9	3.3	3.5
	not urban	5.9	2.4	3.5
internet/PC	not provided by LISS	6.6	3.1	3.5
	provided by LISS	2.5	1.8	0.7
hhtype	single	5.9	3.1	2.8



couple w.o. ch.	6.2	2.6	3.6
couple w. ch.	6.3	3.2	3.1
single parent	5.6	2.1	3.5
other	12.5	6.3	6.3

From Table 1 we also learn that the differences between the age groups were largest in the first half year of 2008, as were the (related) differences between households with pensioners and others. On the other hand, the differences in attrition between households with internet and/or PC provided by LISS and others were higher in the second half of 2008.

From Table 2 it can be surmised that response behaviour has some power in predicting attrition: households that did not provide complete income information when filling out the household questionnaire upon entering the panel are more than twice as likely to leave the panel than households who willingly provided the income information when they entered the panel. The same holds for households where nobody filled out the first health questionnaire (one of the annual core questionnaires in LISS). In addition, households are more likely to drop out of the panel when one of the household members had left the panel in an earlier stage. Notably, when a household member refused to participate in the panel from the start the probability of attrition for the household is not much higher than for the other households.

Table 2. Attrition by response behaviour

		% quits	before 1-7	after 1-7
total		6.2	3.0	3.3
income completed (household qu)				
	no	12.7	5.9	6.8
	yes	5.6	2.7	2.9
respondent health questionnaire in hh				
	no	11.9	5.9	5.9
	yes	5.1	2.4	2.7
member stopped in earlier stage				
	no	5.5	2.6	2.9
	yes	10.2	4.4	5.8
	one member	5.9	3.1	2.8
member never started				
	no	6.0	2.7	3.3
	yes	8.0	4.3	3.8
	one member	5.9	3.1	2.8

One notable question is to what extent immigrants have a higher tendency to drop out from the LISS panel than the native Dutch population. Because ethnic origin of the panel members is only known for respondents to the Religion and Ethnicity (REE) questionnaire we do not have a complete picture. Therefore we have asked Jan van der Laan (Statistics Netherlands) to compare the attrition of households with immigrants and households without immigrants on the basis of register information about the addresses drawn for the LISS sample. Since panel members from the pilot phase of LISS and split-off households could not be included in this analysis, the results are not completely comparable with the previous tables.

Interestingly, from Table 3, we can infer that the differences between the attrition of households with and without migrants are fairly marginal. We do find that households with members that did not fill out the REE questionnaire are more likely to quit than households where all adult members did fill out this questionnaire, but in both groups and in total the differences between households without migrants and households with



nonwestern migrants are fairly marginal. If anything, households with western migrants (and no nonwestern migrants) are less likely to quit than households without migrants, especially after 1 July in the group with household members that did not respond to the REE questionnaire.

Table 3. Attrition by ethnic origin

	% quits	before 1-7	after 1-7
total	6.1	2.8	3.3
hh without migrants	6.2	2.7	3.5
hh with western immigrants	5.4	3.0	2.3
hh with nonw immigrants	7.0	3.7	3.3
all adults responded to REE			
total	4.3	1.9	2.4
hh without migrants	4.3	1.9	2.4
hh with western immigrants	4.4	2.1	2.4
hh with nonw immigrants	4.8	2.1	2.7
not all adults responded to REE			
total	8.9	4.2	4.7
hh without migrants	9.4	4.1	5.3
hh with western immigrants	6.6	4.3	2.3
hh with nonw immigrants	9.1	5.2	3.9

3 Multivariate analysis of attrition

We could present the results of a logit analysis of attrition including all household characteristics of Table 1 as explanatory variables. In that case, most of the coefficients are not significantly different from zero. If we limit ourselves to the variables that make a significant difference in Table 1, we obtain the first column of coefficients in Table 4. We see that age, the provision of internet and the presence of disabled have significant coefficients with the expected sign, but the number of persons in paid employment, the presence of pensioners and the presence of self-employed does not result in significantly different attrition rates in a multivariate analysis. The response behaviour of the panel members (providing complete income information, responding to the health questionnaire, earlier quitting) makes a larger difference to the probability of attrition than the household characteristics included in the analysis.

Table 4. Logit analysis of attrition

variable	coeff.	std.dev.	coeff.	std.dev.
age/10	0.202 *	0.057	0.189 *	0.058
internet provided	-1.230 *	0.318	-1.359 *	0.323
one or more disabled	-0.773 *	0.322	-0.777 *	0.326
in paid employment:none	0.093	0.171	0.025	0.176
in paid employment:two	-0.231	0.159	-0.261	0.173
in paid employment:three or more	0.212	0.312	0.054	0.323
one or more pensioners	-0.190	0.219	-0.043	0.229
one or more self-employed/family b.	0.097	0.176	-0.069	0.191
income completed			-0.795 *	0.162
respondent health			-0.984 *	0.132
member stopped			0.578 *	0.161



member not started			0.358 *	0.176
one person in hh.			0.100	0.170
constant	-3.593 *	0.283	-2.204 *	0.348
Log likelihood	-1171.4		-1123.6	
Pseudo R2	0.0198		0.0599	
N	5133		5133	

In addition to the logit analysis of Table 4 we also provide a multinomial logit analysis in which we differentiate between attrition before and after 1 July 2008 (Table 5). The most notable result is that in both specification, the provision of internet causes a larger difference in attrition after 1 July 2008 than in the first half year of 2008.

Table 5. Multinomial logit analysis of attrition before and after 1 July 2008.

variable	coeff.	std.dev.	coeff.	std.dev.
stopped before 1 July 2008				
age/10	0.160	0.082	0.159	0.082
internet provided	-0.748 *	0.378	-0.923 *	0.385
one or more disabled	-0.732	0.472	-0.698	0.476
in paid employment:none	0.115	0.240	0.003	0.246
in paid employment:two	-0.102	0.232	-0.036	0.253
in paid employment:three or more	0.339	0.450	0.263	0.464
one or more pensioners	0.043	0.312	0.239	0.325
one or more self-employed/family b.	0.396	0.240	0.317	0.261
income completed			-0.746 *	0.228
respondent health			-1.047 *	0.182
member stopped			0.517 *	0.233
member not started			0.491 *	0.242
one person in hh.			0.332	0.239
constant	-4.293 *	0.406	-3.060 *	0.492
stopped after 1 July 2008				
age/10	0.237 *	0.077	0.214 *	0.078
internet provided	-1.934 *	0.591	-2.020 *	0.595
one or more disabled	-0.806	0.433	-0.843	0.436
in paid employment:none	0.075	0.234	0.046	0.239
in paid employment:two	-0.338	0.212	-0.447	0.229
in paid employment:three or more	0.108	0.415	-0.120	0.427
one or more pensioners	-0.394	0.296	-0.286	0.307
one or more self-employed/family b.	-0.194	0.251	-0.436	0.268
income completed			-0.837 *	0.215
respondent health			-0.923 *	0.179
member stopped			0.630 *	0.211
member not started			0.233	0.243
one person in hh.			-0.112	0.233
constant	-4.281 *	0.383	-2.759 *	0.467
Log likelihood	-1388.8		-1339.3	
Pseudo R2	0.0192		0.0541	
N	5133		5133	

Analyses executed by Jan van der Laan (Statistics Netherlands) reveal that the inclusion of dummy variables for the presence of nonwestern and western immigrants in the



households in the regressions of Table 4 and Table 5 (tables not shown) does not give rise to significant coefficients for the migrant status of the households. This confirms the results of Table 3 where we saw that households with immigrants do not show higher quit rates than households without immigrants.