

RC33 Conference 2016
9th International Conference on Social Science Methodology
11-16 September 2016, University of Leicester

Session:
"Effects of respondents' age on interviews"

**Non-response, attrition and age in a cohort study of older
people in Italy: The case of InveCe.Ab study**

Emanuela Sala

Dipartimento di Sociologia e Ricerca Sociale
University of Milano Bicocca
emanuela.sala@unimib.it

Daniele Zaccaria

Golgi Cenci Foundation
d.zaccaria@golgicenci.it

ABSTRACT

Objectives. Longitudinal health surveys of older people have shed little light on the mechanisms that lead respondents to participate in surveys, especially in the first wave of data collection. This paper explored selectivity in Wave 1 response, focusing on gender differences in response patterns.

Methods. Using a rich set of administrative and survey data from the Italian longitudinal study “Brain Aging in Abbiategrasso”, the authors explored the determinants of survey participation, focusing both on respondents’ characteristics and the “household contagion effect”. The study also investigated the reasons for non-response.

Results. The study showed that: individuals whose partners took part in the survey were nearly four times more likely to participate than those whose partners did not; older men and women showed different response patterns, with widowers and women from deprived areas being less likely to respond; the main reason for non-response was a lack of interest in the study.

Conclusions. To counteract response bias, different strategies could be adopted at the different stages of the data collection process, for example the use of a tailored contact approach and post-stratification methods.

Key words. Response rate. Response bias. Older people. Longitudinal studies. Data quality

Introduction

The median age in Italy is among the highest in the world (United Nations 2013). Leaving aside the undisputed positive implications of longevity, an aging population presents health systems and society as a whole with new and pressing challenges, linked to the increasing diffusion of chronic disabilities (Garin et al. 2016). Monitoring older people's physical and cognitive conditions has become a key issue for policy makers and health researchers; it is therefore not surprising that a number of surveys of older people, especially longitudinal health surveys, have been conducted in recent decades, both in the U.S. and in Europe (e.g., the Health and Retirement Study in the U. S. and the Survey on Health, Aging and Retirement in Europe).

Longitudinal surveys are very powerful research tools. However, they pose specific methodological challenges that may hamper the quality of the data collected and undermine the validity of the research findings. In longitudinal surveys, Wave 1 non-response, together with attrition, can be very serious issues, which may limit the potential impact of the research (Lynn 2009). Health surveys must therefore include assessment of the extent to which selectivity affects participation in order to evaluate the quality of the data collected, and the extent to which the findings deriving from their analysis can be generalised to the reference population. As Banks et al. (2011, p. 1) put it: "if attrition from a survey is systematically related to outcomes of interest or to variables correlated with these outcomes, then not only will the survey cease to be representative of the population of interest, but estimates of the relationships between different key outcomes, especially in a longitudinal context, may also be biased". The overall aim of this study was to explore selectivity in the Wave 1 response of a registry-based population survey of older people living in a town near Milan, Italy.

Our study can be set in the context of two different (but complementary) types of literature, namely epidemiological and survey methodology literature. To date, epidemiologists have devoted little attention to the study of non-response in longitudinal surveys of older people, despite the importance of this issue. Indeed, Chatfield et al. (2005), in their literature review on attrition, identified only 25 articles on this topic. This lack of knowledge on Wave 1 non-response is

documented in many papers; Vind et al. (2009), for example, found that only 43% of the papers published in high impact journals reported Wave 1 response rate, even though this is usually seen as a very basic measure of survey participation. With this fundamental information lacking in much of the literature, it is hardly surprising that even fewer authors have attempted a deeper analysis of non-response.

The few studies that have focused on Wave 1 non-response mainly explored the role played in survey participation by three different categories of respondent characteristics, i.e., social and demographic characteristics, physical health and mental health. A consistent finding emerging from analysis of these studies is that being/having been married or having/having had a partner is positively associated with response (Adams et al. 1990; Ives et al. 1994; Nummela et al. 2011; Vass et al. 2007; Vind et al. 2009). Most of the studies also found that the respondents' gender and age were unrelated to survey participation (Adams et al. 1990; Criqui et al. 1978; Launer et al. 1994, Vass et al. 2007). Exceptions include the studies by Jacomb et al. (2002) and Gaertner et al. (2016), which respectively found that men and the “youngest” old subjects were more likely to take part in surveys. Although state of health has been found to be related to response, there is no consensus on the direction of the relationship between these two variables. A minority of studies also explored the role played by socio-economic variables, including education, income and neighbourhood of residence. For example, Vind et al. (2009) and Nummela et al. (2011) found survey participation to be positively related to level of income.

The limitation of the epidemiological studies in this field lies in the very assumption on which they are based, namely that respondents' characteristics are the only drivers of differences in propensity to respond. Instead, we know from the survey methodology literature that participation is also related to other factors, including the design features of the study, interviewers' characteristics and ability, aspects of the interview setting, and so on (Dillman

et al. 2002; Groves and Couper 2012). We know, in particular, that household members' decisions to participate in surveys are not taken independently; indeed, these decisions are often discussed and negotiated with other members of the household (Sala et al. 2012). Drawing on these two different bodies of literature, the first aim of the present study was to explore the determinants of response, focusing on respondents' characteristics as well as on the "household contagion effect", i.e., the extent to which there is a mutual association between two partners' participation in a survey.

Nearly all studies analysing selectivity in Wave 1 response carried out empirical analyses on the whole population, without focusing on men and women separately, or controlling for interaction effects of different variables with gender. However, we know that differences do exist in the health and socio-economic conditions of older men compared with older women (Arber and Ginn 1993; Huisman et al. 2004), and their pattern of response may vary as a result of this (i.e. certain characteristics may act differently in the two sexes in older age). The few studies that have explored these aspects have shown that this seems to be the case; for example, Vind et al. (2009) found evidence that differences in health conditions affected the response patterns shown by older men and older women, and Crique et al. (1978) identified significant interaction effects of gender. The second aim of this study was therefore to better understand response patterns in older men and women, analysing the role that gender plays in the mechanisms that lead older people to take part in surveys.

Finally, to enhance current knowledge on Wave 1 response it is important to understand the reasons why some members of a study population decide not to take part in surveys. Collecting this information is an arduous task, but there is some evidence that health (being either too well or too sick) and lack of interest in the study are among the main reasons for non-participation (Adams et al. 1990; Gaertner et al. 2016; Vass et al. 2007). However, we are not aware of any studies that have performed a deeper analysis of why eligible individuals refuse to take part in surveys. The third aim of our work was thus to offer insight into the reasons for non-response.

Methods

Data

We used data from the Brain Aging in Abbiategrasso study (also known as InveCe.Ab, ClinicalTrials.gov, NCT01345110), a biannual cohort study of older people born between 1935 and 1939 (aged 70-75 at the first wave) and living in Abbiategrasso, a town near Milan, in northern Italy. InveCe.Ab is a registry-based population study that aims to assess older people's physical conditions and identify factors associated with the risk of developing dementia and cognitive impairment. It thus entails the collection of detailed information on respondents' medical and neuropsychological conditions as well as a wide range of data on their socio-economic conditions, including education, housing, past employment, and social relations. Eligible study participants were identified from local registry office records. Wave 1 was carried out in 2010 and obtained a response rate of 76.3% (the Wave 1 eligible participants numbered 1,732). The Wave 1 data collection was a two-stage process. The first stage included collection of blood samples, administration of a face-to-face questionnaire, and evaluation of walking speed; the second stage involved a medical examination and a neuropsychological assessment of cognitive functioning. Information was also collected on the reasons why eligible individuals refused to participate. The study procedures were in accordance with the principles outlined in the 1964 Declaration of Helsinki and subsequent amendments. The study protocol was submitted to and approved by the Ethics Committee of the University of Pavia. More information on the study can be found in Guaita et al. (2013).

Variables

The dependent variable in this study was response at the first stage of the Wave 1 data collection process, computed as AAPOR Response Rate 1 (AAPOR 2008). The independent variables were: year of birth, sex, mortality at 24 months (here considered a proxy for general health), education, marital status, "household contagion effect", and neighbourhood of residence. All of these variables were derived from population registry files provided by the Municipality of Abbiategrasso and linked to Wave 1 data. Education was measured in years of schooling, while

marital status was categorised as married, widowed or single (i.e., divorced and never married). “Household contagion effect” was classified into three categories: both partners took part in Wave 1, only one partner took part in Wave 1, single/no partner eligible for Wave 1. Neighbourhood of residence was coded into four geographical categories that also corresponded to socio-economic differences between the town’s different districts (i.e., town centre, North West, East and South West). It is to be noted that we observed a very low level of item non-response (ranging from 0 to 2.2%) for the variables of interest. The characteristics of the study population are described in Table 1.

Methods of analysis

To identify the variables associated with Wave 1 response and any gender differences in Wave 1 response patterns, we ran a set of binomial logistic regressions, reporting the resulting coefficients as odds ratios (ORs). First, we ran a model with main effects and interactions of gender; we then ran the same model (without interaction effects) for men and women separately. To further explore the characteristics of non-response, we performed a bivariate analysis. All analyses were carried out on all the potential study participants contacted during the first stage of the Wave 1 data collection process, who comprised 1,321 respondents and 323 non-respondents (129 cases had previously been excluded as non-contactable or ineligible). The statistical analysis was performed using Stata Version 12.0 (STATA Corporation, Texas, USA).

Results

What variables were associated with Wave 1 response?

Table 2 shows the findings from the regression model run on the whole sample. A clear pattern emerges from the analysis of the main effects. Indeed, participation in Wave 1 was found to be associated with most of the variables included in the model. It was positively related to education (OR=1.16) and also associated with the partner’s decision to take part in the study. In particular, eligible individuals whose partners agreed to participate were nearly four times more likely to take

part in the study (OR=3.90) than those whose partners refused. It emerged that Wave 1 participation was related to marital status and neighbourhood of residence, too. In detail, widowed people were 50% more likely to participate than married people (OR=1.5), whereas elderly people living in the South West of Abbiategrasso, the most rural part of the town, were about 60% less likely to take part (OR=0.39). Examining two-way interaction effects between our independent variables and gender, we found that the interaction effect between gender and marital status was significant.

What were the gender differences in Wave 1 response?

Table 3 shows results from the same regression model (in this case without interactions) run separately for the men and the women. Two clear findings stand out from this analysis; both marital status and neighbourhood of residence showed a variable impact between the sexes. Indeed, although there emerged no strong differences when considering the women – note, nevertheless, that the coefficient for widows was borderline –, in the men, on the other hand, marital status was found to be associated with participation in the study; widowers were 44% less likely than married men to take part in the study (OR=0.56). Furthermore, the effect of neighbourhood of residence disappeared when only the men were considered, whereas it remained significant in the women. In particular, the women from the South West were 62% less likely to participate than those living in the centre, which is the wealthiest area of the town (OR=0.38). Considering neighbourhood of residence as an indicator of social class, we conclude that in the women the decision to take part in the study was dependent on their socio-economic background. This analysis also showed some indication of an association between propensity to respond and state of health in elderly men; in particular, the male respondents who died during the first 24 months of the study were 64% less likely to participate than those who did not (OR=0.36; p.=0.079).

Why did eligible individuals refuse to take part in the survey?

Finally, we investigated the reasons for refusing to participate in the survey. Of the 323 individuals who refused, 63.2% declared that they were not interested in the study, whereas 25.1% and 11.8% did

not participate for health-related problems and family commitments, respectively (see supplementary materials, Table 4). In this elderly population, we found gender differences in the reasons given for refusal to participate: the men were more likely than the women to refuse out of lack of interest in the study (72.2% vs 58.6%), while the women were more likely than the men to decline because of health-related problems (27.9% vs 19.4%). The relationship between the abovementioned variables was significant at the 10% level (Pearson $\chi^2 = 5.7875$; $p = 0.055$; $df = 2$).

When controlling for associations between the independent variables and reasons for non-response, we found no evidence of bias (see additional materials, Tables 5-8). The only exception was the association between education and non-response; it was found that people with a lower and those with higher level of education could have different reasons for deciding not to participate (Pearson $\chi^2 = 5.3218$; $p = 0.070$; $df = 2$). The former were more likely to decline to take part out of lack of interest (64.7% for those with less education, 56.9% for those with more education), and the latter due to family commitments (9.7% for those with less education, 20% for those with more education). Due to the small sample size, we were unable to break this analysis down by gender.

DISCUSSION

This study was conducted in order to explore the Wave 1 response patterns of elderly men and women participating in the Italian longitudinal study InveCe.Ab; this work also shed light on the reasons for refusal to participate in the survey. These are key issues, because if selectivity in response is not random, research findings may not be valid.

This study, exploiting a rich set of municipal administrative data, contributes to the advancement of current knowledge in this field in a number of ways. First, in line with previous studies¹⁴, it shows that survey participation is related not only to certain socio-economic and demographic variables (i.e. education, neighbourhood of residence, marital status, etc.), but also to whether or not one's partner decides to participate. It thus confirmed that the decision to participate in a survey is not an individual one, but rather one that partners take together. One of the key findings of this study was that individuals belonging to a couple in which both partners opted to take part in the survey were nearly four times more likely to participate than those in which only one partner agreed. Second, the response pattern was found to vary by gender; for example, the women showed no association between marital status and participation, whereas marital status was an important determinant of participation in the men. Widowers were 50% less likely than married men to participate in the study. This finding is consistent with previous research, which has shown that in men the loss of a partner may lead to social exclusion and ill health, including depression and cognitive impairment (Lee et al. 2001; Van Gelder et al. 2006; Van Grootheest et al. 1999). Third, we found that the main reason for non-response was a lack of interest in the study, and also that there may be associations between the different reasons for non-response and some individual characteristics (e. g., gender, education). This is a novel finding.

The findings of this study have important practical implications. During the data collection stage of a survey several strategies could be adopted in order to reduce selectivity in response and limit the number of refusals. For example, interviewers could be trained to tackle the problem of refusals by seeking to encourage joint participation by couples, and new survey materials could be designed that better highlight the importance of the study. In addition, given that response pattern was found to vary

by gender, different materials could be prepared for elderly men and elderly women. The impact of response bias could be reduced (and possibly removed) by creating a set of post-stratification weights, thereby fully exploiting the value of the available administrative data. Indirectly, our work also has implications for public health policymaking and practice. Survey data constitute a key tool for health researchers and policy makers; an understanding of the limitations of such data, as well as a grasp of the solutions that may be implemented to overcome them, may indirectly contribute to the design of more effective public health policies.

This study has three major limitations. First, we were not able to explore in depth the influence of state of health on non-response; this is due to the fact that the administrative data kept by Italian local municipalities do not include this kind of information. For future waves of the study, we are evaluating the possibility of linking up the survey data with health records kept by regional health departments. Second, selectivity in key substantive survey items, such as respondents' cognitive abilities, was not assessed, with the result that issues linked to non-response bias in these items remained unexplored. This is because, at the Wave 1 data collection stage, we did not prepare a shorter version of the questionnaire that could have been used to collect information on individuals who refused to participate. Third, the small sample size precluded a more detailed analysis of non-response, limiting the statistical and analytical power of the analysis (chi-square test results are dependent on sample size). Further studies are needed to reinforce the findings of this work and shed light on some of the issues that remained unexplored.

REFERENCES

- Adams MM, Scherr PA, Branch LG, et al. (1990) A comparison of elderly participants in a community survey with nonparticipants. *Public Health Rep* 105:617-22.
- The American Association for Public Opinion Research AAPOR (2008) *Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys*. 5th ed. Lenexa, KS: AAPOR
- Arber S, Ginn J. Gender and inequalities in health in later life (1993) *Soc Sci Med* 36:33-46.
- Banks J, Alastair M, Smith JP. Attrition and health in ageing studies: evidence from ELSA and HRS (2011) *Longitudinal and Life Course Studies* 2:101-26.
- Chatfield MD, Brayne CE, Matthews FE (2005) A systematic literature review of attrition between waves in longitudinal studies in the elderly shows a consistent pattern of dropout between differing studies. *J Clin Epidemiol* 58:13-9.
- Criqui MH, Barrett-Connor E, Austin M (1978) Differences between respondents and non-respondents in a population-based cardiovascular disease study. *Am J Epidemiol* 108: 367-72.
- Dillman DA, Eltinge JL, Little RJA, editors (2002) *Survey nonresponse*. New York: Wiley & Sons.
- Gaertner B, Seitz I, Fuchs J, et al.(2016) Baseline participation in a health examination survey of the population 65 years and older: who is missed and why? *BMC Geriatr* 16:21.
- Garin N, Koyanagi A, Chatterji S, et al. (2016) *Global Multimorbidity Patterns: A Cross-Sectional, Population-Based, Multi-Country Study*. *J Gerontol A Biol Sci Med Sci* 71:205-14.
- Groves RM, Couper MP (2012) *Nonresponse in household interview surveys*. New York: John Wiley & Sons.
- Guaita A, Colombo M, Vaccaro R, et al. (2013) Brain aging and dementia during the transition from late adulthood to old age: design and methodology of the “Invece. Ab” population-based study. *BMC Geriatr* 13:98.
- Huisman M, Kunst AE Andersen O, et al. (2004) Socioeconomic inequalities in mortality among elderly people in 11 European populations. *J Epidemiol Community Health* 58:468-75.

- Ives DG, Traven ND, Kuller LH, Schulz R (1994) Selection bias and nonresponse to health promotion in older adults. *Epidemiology* 5: 456-61.
- Jacomb PA, Jorm AF, Korten AE, Christensen H, Henderson AS (2002) Predictors of refusal to participate: a longitudinal health survey of the elderly in Australia. *BMC Public Health* 2:4.
- Launer LJ, Wind AW, Deeg DJ (1994) Nonresponse pattern and bias in a community-based cross-sectional study of cognitive functioning among the elderly. *Am J Epidemiol* 139: 803-12.
- Lee GR, DeMaris A, Bavin S, Sullivan R (2001) Gender differences in the depressive effect of widowhood in later life. *J Gerontol B Psychol Sci Soc Sci* 56:S56-61.
- Lynn P, editor. *Methodology of longitudinal surveys* (2009) Chichester: John Wiley & Sons.
- Nummela O, Sulander T, Helakorpi S, et al. (2011) Register-based data indicated nonparticipation bias in a health study among aging people. *J Clin Epidemiol* 64:1418-25.
- Sala E, Burton J, Knies G (2012) Correlates of obtaining informed consent to data linkage respondent, interview, and interviewer characteristics. *Sociological Methods & Research* 41: 414-439.
- Van Gelder BM, Tijhuis M, Kalmijn S, Giampaoli S, Nissinen A, Kromhout D (2006) Marital status and living situation during a 5-year period are associated with a subsequent 10-year cognitive decline in older men: the FINE Study. *J Gerontol B Psychol Sci Soc Sci* 61: P213-9.
- Van Grootheest DS, Beekman AT, Broese van Groenou MI, Deeg DJ (1999) Sex differences in depression after widowhood. Do men suffer more? *Soc Psychiatry Psychiatr Epidemiol* 34:391-8.
- Vass M, Avlund K, Hendriksen C (2007) Randomized intervention trial on preventive home visits to older people: baseline and follow-up characteristics of participants and non-participants. *Scand J Public Health* 35: 410-7.
- Vind AB, Andersen HE, Pedersen KD, Jørgensen T, Schwarz P (2009) Baseline and follow-up characteristics of participants and nonparticipants in a randomized clinical trial of multifactorial fall prevention in Denmark. *J Am Geriatr Soc* 57:1844-9.
- United Nations, Department of Economic and Social Affairs, Population Division. 2013; *World Population Ageing 2013*. ST/ESA/SER.A/348.

Table 1 Characteristics of the InveCe.Ab study population (N= 1644)

Year of birth (%)	
1935	17.21
1936	16.97
1937	20.01
1938	22.99
1939	22.81

Sex (%)	
Women	56.51
Men	43.49

Marital status (%)	
Married	65.34
Single	8.90
Widowed	25.76

Education (years)	
Min.	0
Max.	20
Mean	6.25
St. Dev.	2.87

Neighbourhood of residence (%)	
Town Centre	7.63
North West	29.89
East	47.36
South West	15.13

Table 2 Odd ratios (based on logistic regression model) for different characteristics of participants versus non-participants

	OR	p	95% CI
<i>Year of birth</i>			
1935 (ref.)			
1936	0.89	0.616	0.58-1.38
1937	1.01	0.979	0.65-1.55
1938	1.01	0.974	0.66-1.53
1939	0.86	0.498	0.56-1.33
<i>Male</i>	1.40	0.659	0.31-6.29
<i>Education</i>	1.16	0.000	1.08-1.25
<i>Gender X Education</i>	1.06	0.348	0.94-1.21
<i>Partner's behaviour</i>			
Partner refused (ref.)			
Partner particip.	3.90	0.000	1.98-7.67
No partner	3.82	0.000	2.10-6.93
<i>Gender X Partner's behaviour</i>			
Male X No partner (ref.)			
Male X Partner particip.	1.37	0.404	0.65-2.86
Male X Partner refused	1.20	0.672	0.52-2.78
<i>Marital status</i>			
Married (ref.)			
Single	1.22	0.496	0.69-2.18
Widowed	1.50	0.044	1.01-2.23
<i>Gender X Marital Status</i>			
Male X Single (ref.)			
Male X Single	0.69	0.462	0.26-1.84
Male X Widowed	0.37	0.002	0.20-0.69
<i>Neighbourhood</i>			
Town centre (ref.)			
North West	0.50	0.081	0.23-1.09
East	0.56	0.126	0.26-1.18
South West	0,39	0.022	0.17-0.87
<i>Gender X Neighbourhood</i>			
Male X Town centre (ref.)			
Male X North-West	1.12	0.875	0.29-4.36

Male X East	1.03	0.964	0.27-3.91
Gender X South West	1.55	0.550	0.37-6.48
<i>Death</i>			
No (ref.)			
Yes	0.91	0.897	0,23-3,57
<i>Male X Death</i>			
	0.40	0.305	0.07-2.33
Number of observations	1594		
Pseudo R ²	0.08		

Table 3 Odd ratios (based on logistic regression models run separately for men and women) for different characteristics of participants versus non-participants

	WOMEN			MEN		
	OR	P	95% CI	OR	P	95% CI
<i>Year of birth</i>						
1935 (ref.)						
1936	0.86	0.592	0.50-1.49	0.95	0.895	0.47-1.95
1937	0.99	0.972	0.58-1.69	1.02	0.960	0.50-2.09
1938	1.05	0.857	0.62-1.78	0.91	0.783	0.46-1.80
1939	0.70	0.203	0.41-1.21	1.22	0.579	0.60-2.51
<i>Education</i>						
	1.16	0.000	1.08-1.25	1.23	0.000	1.11-1.36
<i>Partner's behaviour</i>						
Partner refused (ref.)						
Partner particip.	4.11	0.000	2.08-8.14	4.51	0.000	2.15-9.47
No partner	3.87	0.000	2.12-7.05	3.08	0.000	1.69-5.61
<i>Marital status</i>						
Married (ref.)						
Single	1.21	0.516	0.68-2.16	0.85	0.678	0.38-1.87
Widowed	1.46	0.060	0.98-2.18	0.56	0.018	0.35-0.91
<i>Neighborhood</i>						
Town centre (ref.)						
North West	0.50	0.078	0.23-1.08	0.53	0.274	0.17-1.65
East	0.56	0.125	0.26-1.18	0.55	0.292	0.18-1.67
South West	0.38	0.020	0.17-0.86	0.57	0.350	0.17-1.86
<i>Death</i>						
No (ref.)						
Yes	0.89	0.875	0.23-3.50	0.36	0.079	0.11-1.13
Number of observations	904			690		
Pseudo R ²	0.06			0.09		

Table 4 Reasons for refusal by gender (%)

<i>Reason for refusal</i>	<i>Gender</i>		
	Women	Men	Total
Not interested	58.6	72.2	63.2
Health problems	27.9	19.4	25.1
Family commitments	13.5	8.3	11.8
Total (n)	100 (215)	100 (108)	100 (323)

Note: Pearson's $\chi^2 = 5.7875$; $p = 0.055$; $df=2$

Table 5 Reasons for refusal by years of education (%)

<i>Reason for refusal</i>	<i>Years of education</i>		
	Up to 5	More than 5	Total
Not interested	64.7	56.9	63.2
Health problems	25.6	23.1	25.1
Family commitments	9.7	20.0	11.8
Total (n)	100 (258)	100 (65)	100 (323)

Note: Pearson's $\chi^2 = 5.3218$; $p = 0.070$; $df=2$

Table 6 Reasons for refusal by year of birth (%)

<i>Reason for refusal</i>	<i>Year of birth</i>					
	1935	1936	1937	1938	1939	Total
Not interested	57.7	66.7	58.5	64.4	67.1	63.2
Health problems	23.1	20.0	29.2	24.7	27.4	25.1
Family commitments	19.2	13.3	12.3	11.0	5.5	11.8
Total (n)	100 (52)	100 (60)	100 (65)	100 (73)	100 (73)	100 (323)

Note: Pearson's $\chi^2 = 7.1948$; $p = 0.516$; $df=8$

Table 7 Reasons for refusal by marital status (%)

<i>Reason for refusal</i>	<i>Marital status</i>			Total
	Married	Single	Widowed	
Not interested	63.8	63.0	63.9	63.7
Health problems	25.6	14.8	24.1	24.3
Family commitments	10.6	22.2	12.1	12.0
Total (n)	100 (207)	100 (27)	100 (83)	100 (317)

Note: Pearson's $\chi^2 = 3.8278$; $p = 0.430$; $df=4$

Table 8 Reasons for refusal by neighbourhood (%)

<i>Reason for refusal</i>	<i>Neighbourhood</i>				Total
	City centre	North West	East	South West	
Not interested	57.1	66.0	65.3	57.6	63.8
Health problems	35.7	23.0	23.8	25.4	24.4
Family commitments	7.1	11.0	10.9	17.0	11.9
Total (n)	100 (14)	100 (100)	100 (147)	100 (59)	100 (320)

Note: Pearson's $\chi^2 = 3.1692$; $p = 0.787$; $df=4$